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RESTAURANT FACILITIES FOR SHIPYARD WORKERS

By
FREDERICK S. CRUM

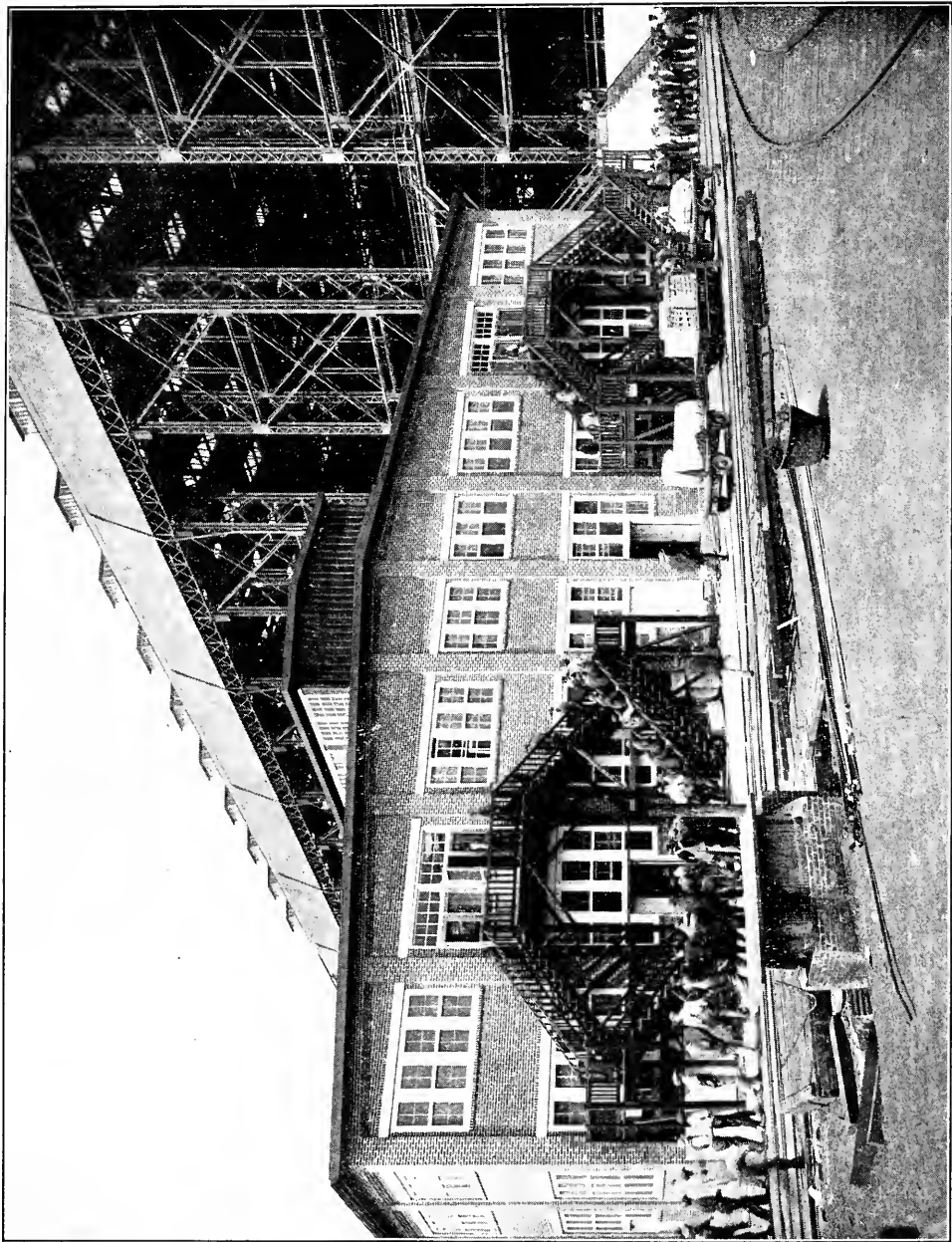


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THE INDUSTRIAL RELATIONS DIVISION
UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
PHILADELPHIA, PA.

1918



EXTERIOR VIEW, CAFETERIA OF THE NEW YORK SHIPBUILDING COMPANY, CAMDEN, N. J., SEPTEMBER, 1918

RESTAURANT FACILITIES

FOR

SHIPYARD WORKERS

“The provision of proper meals for the workers is, indeed, an indispensable condition for the maintenance of output on which our fighting forces depend, not only for victory, but for their very lives.” (The Times, London, September 25, 1916.)

“Not only is the health of the employees better as a result of these provisions, but engagement by the firm becomes more attractive and the range of a selection amongst applicants for employment is greatly extended, and the filling of vacancies when vacancies occur, or at times when the staff is being increased, present fewer difficulties. Enlightened self-interest and consideration in these and other details for the advantage of the employees *is the keystone of successful management.*” (Sir William Lever, September 26, 1916.)

PREPARED BY

FREDERICK S. CRUM

ASSISTANT STATISTICIAN, THE PRUDENTIAL INSURANCE CO. OF AMERICA
AND
STATISTICIAN, LABOR REQUIREMENTS AND STATISTICS BRANCH, U. S. S. B. E. F. C.



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A DINING ROOM, SUBMARINE BOAT CORPORATION, NEWARK, N. J., MAY, 1918

FOREWORD

Coöperation has been sought from various sources in the preparation of this pamphlet and in every instance it has been given willingly and promptly. Special acknowledgment is made of the loan of plans of cafeterias, the originals of which must, in most cases, have been made at considerable expense. The names of these generous contributors are given on the copies of the plans and drawings presented herein. These copies and adaptations, with most of the annotations accompanying them, have been made by Mr. Walter De Mordaunt, architect, Statistical Section, Emergency Fleet Corporation.

The section on health and sanitation has been prepared under the direction of Lieut.-Col. P. S. Doane, M. C. N. A., director of the Health and Sanitation Section, Industrial Relations Division, Emergency Fleet Corporation.

The section on lunch-room accounting has been prepared by Mr. Gordon Wilson, general auditor of the Emergency Fleet Corporation.

It is hoped that this pamphlet may be found useful in the promotion of better restaurant facilities in American shipyards. If this object is attained, we are confident that the vast shipbuilding program will be materially hastened, and the reasons for this opinion are set forth in considerable detail in the following pages.

A wide and varied industrial experience is justification for the hope and belief that shipyard restaurants, cafeterias, and lunch rooms properly constructed, equipped, and managed will add health and strength to the shipbuilders and bind employers and employees more closely together in an invincible unit for the single purpose—to *speed the building of ships*.

MEYER BLOOMFIELD.

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THE ADVANTAGES OF ADEQUATE RESTAURANT FACILITIES IN OR NEAR SHIPYARDS

Extensive and careful surveys and inquiries prove indisputably that in the majority of the shipbuilding plants operating in the United States there is urgent need for more adequate restaurant and lunch room facilities. This pamphlet has been prepared primarily for the purpose of presenting helpful suggestions to such managers of shipbuilding plants as have already realized the importance and urgency of this need. The broader purpose of the pamphlet is so to stress the good results obtainable from proper and adequate eating places in or near the shipyards that many other managers of shipbuilding and other industrial establishments will undertake the task of making such provision.

VALUE OF COMPANY CAFETERIAS AND RESTAURANTS

The value of the company restaurant had been demonstrated again and again, both in this country and abroad, long before the beginning of the present world-wide conflict. The great war has not only given further proof of this value, but it has emphasized the urgent necessity for a wide extension of this particular form of industrial welfare activity. The English experience bears eloquent tribute to the truth of these statements, and the reports of the Health of Munition Workers' Committee on Industrial Canteens should be read by all who may have any doubts on the subject.

In this country many successful company restaurants and cafeterias were in operation long before the outbreak of the war, and their success had been attested not merely by the fact that they were financially self-sustaining but, and this is of even greater importance, because they had contributed directly to the improvement of the health and the industrial efficiency of the workers. Many employers had found that it pays "in actual dollars and cents to supply a wholesome, nourishing meal to an underfed employee." They had discovered that "an anæmic industrial army is predestined to retreat and defeat" for the efficiency of such an army is just as dependent upon the quality and quantity of its food supply as is a military army. No commander by word or act has yet successfully denied the truth of Napoleon's declaration that a military army moves forward on its stomach.

AMERICAN TESTIMONIALS IN FAVOR OF COMPANY RESTAURANTS

The Metropolitan Life Insurance Co. has operated a company lunch room for its employees for several years and reports that "the clerks, printers, and mechanics were immediately benefited by this addition to their mid-day meal. Their health was improved; the quality of their work was bettered; and the success of the experiment was so great that an extension of the service was unhesitatingly undertaken."

The president of the National Cash Register Co., Mr. John H. Patterson, has stated that the first small experiment of that company in attempting to solve the food problem gave such noticeable and immediate results that the extension of the experiment was at once provided for and was carried on to its present notable proportions.

The National Biscuit Co. of New York considers that its restaurant has proved an excellent investment because of "general improvement in the health of its workers."

The American Sheet and Tin Plate Co. of Pittsburgh now operates ten restaurants in their various works. These restaurants are of the cafeteria type, are open 24 hours per day, are patronized by from 60 to 75 per cent. of the employees and, after considerable experience, this company believes "that by having restaurants where wholesome hot meals, prepared under sanitary conditions, can be obtained at reasonable prices, the workmen are kept more healthy and contented."

The Illinois Steel Company believes that the restaurant facilities provided for its men have had a marked and favorable effect upon the accident record. The conditions previous to the installation of such facilities are described as follows:

The men rushed from the plant to the saloon and hurriedly swallowed the bad lunches and the worse drinks and then rushed back to their work. Some men did this from choice and others, particularly the new employees who had not as yet found boarding places, did it from necessity. Regardless of whether it was done from necessity or choice, the result of the bad lunches and drinks was reflected in production and in the accident record. Investigation of a large number of accidents proved beyond any question of doubt that the cause was directly traceable to these lunches and drinks.

At Joliet we are thoroughly convinced that the lunch room has been of material benefit in our accident-prevention campaign, has increased efficiency and has minimized time lost through sickness. It is so well thought of by the Illinois Steel Co. and the United States Steel Corporation that, in addition to the one at Joliet works, we have three plant lunch rooms in operation at our South Chicago works and one is under construction at our Gary works. (Extracts from Illinois Steel Co.'s letter of Apr. 2, 1918.)

The following quotation confirms the experience of the Illinois Steel Company:

Lunch rooms, like emergency hospitals, belong probably among the more essential features of industrial betterment, for while the provision of recreational facilities of different kinds tends to promote good fellowship and interest in the place of employment, these facilities do not have as direct a bearing on the health of the workers as the opportunity to secure a warm and wholesome meal at a cost which puts it within the reach of all. ("Lunch Rooms for Employees," by Anice L. Whitney, Monthly Review of the U. S. Bureau of Labor Statistics, December, 1917, p. 207.)

THE EXPERIENCE OF ENGLAND WITH INDUSTRIAL CANTEENS HAS BEEN EXCEPTIONALLY SATISFACTORY

The industrial canteen has played an important part in England's war activities. "I am delighted to see these canteens spring up throughout our workshops," said Mr. Lloyd George, in February, 1916. "They make an enormous difference. That men should get their meals, not in the old, squalid, uncomfortable conditions, but in conditions which are in themselves attractive and healthful—is better for the workingman and those who are in charge."

The following testimony by a committee specially charged by the Minister of Munitions to report upon industrial canteens was presented in 1915, and it has subsequently been reiterated many times, for this welfare institution has proved itself of inestimable value as the need for industrial efficiency has become more and more urgent in that country.

The committee have been impressed with the consensus of opinion which they have received as to the substantial advantages both to employers and workers following the establishment of an effective and well-managed canteen. These benefits have been direct and indirect. Among the former has been a marked improvement in the health and physical condition of the workers, a reduction in sickness, less absence and broken time, less tendency to alcoholism, and an increased efficiency and output; among the latter has been a saving of the time of the workman, a salutary though brief change from the workshop, greater contentment, and a better midday ventilation of the workshop. The committee are satisfied that the evidence of these results is substantial, indisputable, and widespread. In the isolated cases where the canteen has failed it has been evident that its failure has

been due to exceptional circumstances, misuse by the workers or mismanagement. In almost all large works the committee find that there is a body of men or women (averaging at least 25 per cent) who in the interest of physical health and vigor need canteen provision at the factory. They are convinced that this group of ill-fed workers accounts in a large degree for such inefficiency as exists, and that its energy and output is reduced in the absence of suitable feeding arrangements. The committee have been impressed not only with the improved nutrition manifested by the users of the canteen, but by a lessened tendency to excessive consumption of alcohol, by the prevalence of the spirit of harmony and contentment engendered, and by an increase in efficiency." (Health of Munition Workers' Committee Report on Industrial Canteens, pp. 6-7, London, 1915.)

This same committee summed up the benefits resulting from the establishment of industrial canteens as follows:

DIRECT BENEFITS.

1. Marked improvement in health of worker.
2. Less sickness.
3. Less absence and broken time.
4. Less tendency to alcoholism.
5. Increased efficiency and output.

(Handbook, Health of the Munition Worker, p. 70, London, 1917.)

INDIRECT BENEFITS.

1. Saving time of worker.
2. Salutory change from workshop.
3. Greater contentment of worker.
4. Better midday ventilation of workshop.
5. Increase of recreation and games in spare time.

A large amount of additional evidence is readily available which could be drawn upon further to clinch the argument in favor of industrial canteens, but probably enough has been given to convince any reasonable person that good food, well prepared, served under sanitary conditions, in an attractive way and at reasonable cost, is almost certain to prove of great value both in speeding production and in keeping the workers in good health.

NEED FOR BETTER RESTAURANT FACILITIES IN AMERICAN SHIPYARDS

The urgent need for better restaurant and lunch room facilities in the shipyards can, perhaps, best be illustrated by extracts from several of the replies to a questionnaire recently sent out by the Division of Passenger Transportation and Housing of the Emergency Fleet Corporation. The following excerpts are only a few of the many similar statements made in these replies:

The town possesses no restaurants or cafeterias, but several small lunch rooms have recently been established. Complaints from our various employees bring out the fact that the lunch rooms and the manner of obtaining food are very unsatisfactory and inadequate.

Boarding houses and restaurants are scarce, very inadequate, and poor.

One private restaurant is available to accommodate 1,000 men. This is not satisfactory, the food is not well served, and the company (shipyard) has had numerous complaints about the quality of the food.

There are only a limited number of satisfactory boarding houses available. There are no restaurants or lunch rooms.

At present there are no restaurant facilities available near the yard.

There are many private boarding houses accessible to the shipyard, but they are inadequate and unsatisfactory. The majority are second-class places. The food and sanitary conditions are very questionable.

Restaurants are few, inadequate, and unsatisfactory. Most are operated by Greeks. The food is not well selected, cooked, or served.

The available restaurants are privately managed. They are inadequate, unsatisfactory, and unclean. The food is poorly cooked and poorly served.

There are no restaurants in the village. The company (shipyard) is at present operating four boarding houses.

The available restaurants are unsatisfactory and the prices are too high. The colored laborers get food from "food peddlers." One-half the white laborers bring their lunches and the remainder go home at noon for lunch.

There are no available restaurants, but several bakeries, two lunch wagons, and a few boarding houses.

There are no restaurants or cafeterias near yard.

The only near-by restaurants are two undesirable saloon boarding houses.

Boarding houses and restaurants are poor and 20 minutes distant. Badly in need of better arrangements.

The local restaurants are mainly run by Greeks and are uninviting. They are none too clean and the food is poorly cooked. The majority of the workers carry lunches.

The restaurants are privately managed and too small. They are fairly clean, but the food is poorly cooked.

There are several private boarding houses and one cafeteria near the yard. These are unsatisfactory inasmuch as the board is too expensive.

If any further proof is wanted that many of the shipyards are in urgent need of better restaurant and lunch room facilities than are now available, such proof is furnished in the following brief extracts from many detailed reports of the sanitary inspectors of the Health and Sanitation Section of the Emergency Fleet Corporation:

Restaurants are in connection with saloons, as a rule.

Most of the men bring their lunches and eat in the shops, as indicated by debris and papers. This condition should be corrected.

No provision has been made in or near the shops for eating, so the men bring their lunches and eat in the shops or patronize near-by saloons and restaurants.

There is one lunch room with accommodations for about 50 men in the yard. There are numerous saloons and restaurants fairly close at hand.

Restaurants and kitchens in a very dirty condition. Food of poor grade and poorly prepared. Tableware and linen dirty; in fact, general lack of care or even slightest attention to the use of soap and water.

Because of lack of proper supervision and evident disagreement between the several people who are interested in the restaurant, the premises are in a filthy condition.

Restaurants and other eating places are entirely lacking. The only eating place near the yard was a small lunch room for the watchmen.

There is no provision for eating and little open space. The men eat in the shops, which results in untidy and unsanitary condition of the floors.

A WITNESS FROM THE PACIFIC COAST

The following excerpts from a recent letter written by the master of a Coast Artillery boat operating on the Pacific coast give a vivid portrayal of a specific instance where there is urgent need for restaurant or canteen facilities for the shipbuilders.

While my vessel was laid up for repairs a short time ago at a local shipyard some conditions came to my attention which I believe greatly impede the speeding up of shipbuilding, so essential for us to win the war.

My crew were feeling and working well all the morning. At noon they knocked off for lunch and not much was accomplished during the remainder of the day. I investigated, and found that they had gone outside the yard gate and bought some food from hucksters, none other being obtainable near at hand, the yard being a mile from town.

The shipyard employs over 5,000 highly paid men. Huckster wagons gather in large numbers outside the gate at the noon hour; they are under no jurisdiction, and what they purvey is something awful—food unfit for human consumption and handled under the most insanitary conditions. The workmen often pay dearly in the long run on account of sickness, which in turn causes lay-offs with loss of high pay. The Government suffers much more not only by the loss of the man's work, but also by loss of "pep" in hundreds of men, who, like mine, become indisposed if not wholly incapacitated as the direct result of the food.

The conditions here so vividly described are quite common not only on the Pacific coast, but also on the Atlantic and Gulf coasts, on the Great Lakes, and elsewhere.

The foregoing statements would appear to supply ample proof that improvements in restaurant facilities are highly to be desired in many, if not most, of the American shipyards. Inasmuch as the evidence is universal and overwhelming that adequate restaurants and lunch rooms result in "an immediate improvement in physique, a marked increase in productive efficiency, and an improvement in personal relations throughout the shop,"¹ there is good reason to believe that the industrial canteen will soon become as universally indispensable and popular with the employers and employees of our American shipyards as it is with the munition workers of England and with a large number and variety of industrial and commercial plants and companies in the United States.

SUCCESSFUL CAFETERIAS' AND RESTAURANTS IN AMERICAN SHIPYARDS

It is distinctly encouraging to note that several shipbuilding companies have already completed plans for cafeteria and other modern restaurant and lunch room facilities; many other companies have announced that it is their intention to build, equip, and operate plant restaurants in the near future; and quite a few companies already have such facilities in or near their yards, some of which appear to be above criticism. The following excerpts from recent reports by sanitary engineers of the Health and Sanitation Section of the Emergency Fleet Corporation indicate very clearly that the industrial canteen is rapidly gaining favor in our American shipyards:

There is a large dining room and cafeteria conveniently furnishing meals to 250 men at a sitting. All kitchen appointments are of the best, the food is clean, appetizing, and well served. For 30 cents a man can eat his fill, or he can bring his own lunch and get coffee or soup at reasonable prices. Another smaller lunch room is provided for men bringing their own food. The arrangement is a splendid one in every particular.

The restaurant and cafeteria will seat 750 men and is equipped in the finest manner possible. It recently received a mark of 98 per cent perfect from the city inspector in matters of sanitation, food handling, and supply. Prices are very low, and this room is available for men bringing their lunches as well as for those who wish to buy meals.

A very comfortable lunch room is maintained at which hot food can be obtained at reasonable prices; also candy, tobacco, and small supplies of various kinds. Men bringing lunch pails are provided with a steam rack for keeping the lunch warm. Food supplies are of the best, the kitchen arrangements are thoroughly sanitary, and constant inspection maintains this standard.

Construction of a splendid eating place is under way. There will be accommodation for 500 at the start, with room for expansion. Good meals will be served at cost, under the most modern and sanitary conditions.

The company conducts a restaurant in the yard. It is comfortable and well arranged—kitchen and dining room for 200 men. It is well lighted and ventilated, completely screened, and generally in good condition. Government-inspected meat is used. Good refrigerators are installed and they are cleaned daily. Meals are served at 25 cents.

The company conducts a restaurant within the yards for the accommodation of the workers. It has a cooking and seating capacity of from 450 to 500 men. The restaurant is well equipped and appears to be well conducted. The price charged for breakfast and supper is 30 cents and 35 cents for dinner.

The American International Shipbuilding Corporation has planned and partially completed quite elaborate restaurant facilities for its extensive plant at Hog Island, Philadelphia. When completed, facilities will be available for the feeding of 40,000 or more employees, and the results already achieved indicate that the restaurant project there will be given the prominence and careful attention which its importance warrants.

The Submarine Boat Corporation at Newark, N. J., also has already completed quite extensive restaurant facilities which are being rapidly expanded in

¹ The Problem of Physical Efficiency in the Shipyards, by L. Erskine, p. 9.

accordance with plans which have been drawn for buildings and equipment to accommodate some 15,000 or more employees. The following extracts from a recent letter by the general manager of the corporation are worth quoting as an indication of the importance that this shipbuilding company attaches to an industrial canteen:

[Extracts from letter written by the general manager, Submarine Boat Corporation, Mar. 28 1918.]

The feeding system is run strictly along company lines, the food being sold at cost of material and labor, but excluding rent, heat, and light. At the outset it was decided not to put the commissary on any contract basis, as it was believed that the best results for the employees could be obtained by operating on a noncommercial basis with a man of experience in charge. The results obtained have confirmed the wisdom of this course.

The head of the commissary is a man of broad experience in this line, having had 25 years' experience in the hotel and restaurant business, private catering, and the feeding of State troops. He assumed charge on December 1, 1917, and plans were immediately formulated to take care of 15,000 employees.

ARRANGEMENT OF MESS HALLS

The yard is divided into two parts, running east and west, the administration building being located in the center, on the dividing line. The ways are located on the eastern half of the yard, bordering on the bay.

To feed the workers on the ways, provision has been made for seven mess halls, each designed to feed the workers of four ways. These mess halls are located near the work, thus saving the time of the men in going to and from the mess halls.

There are two template shops in the yard, one located north and the other south of the administration building. A mess hall of the same dimensions as those on the ways has been located adjacent to each of these shops to feed the men working there.

At the southwest end of the yard is located the light fitting shop, with a working capacity of 3,000 men. One of the larger mess halls has been built adjoining this shop to take care of feeding this force.

At the west side of the plant, near the entrance, is located the heavy fitting shop, with a capacity of 3,000 men. Adjoining this shop is the other large mess hall.

CENTRAL KITCHEN

To supply the food for the 11 mess halls, there is being constructed a central kitchen where the food will be cooked and from which it will be distributed to the various units. The kitchen will have an area of 2,400 square feet, and will be able to prepare the food for 15,000 to 16,000 persons at the noon meal. This central kitchen is located at the south end of the plant, and the food will be transported to the mess halls in prime condition by auto trucks. When the food reaches the mess halls it will be placed upon steam tables so that it may be served hot to the men.

At the present time there are three units in actual operation, an average of about 900 people being fed in two of the mess halls in one and one-half hours. The food for these units, outside of the main restaurant and hotel, is supplied from the same kitchen. The same grade of food that is served in the restaurant to the office help is supplied to the laborers and mechanics, and this policy will be continued throughout, the central kitchen feeding all the units with the same grade of provisions.

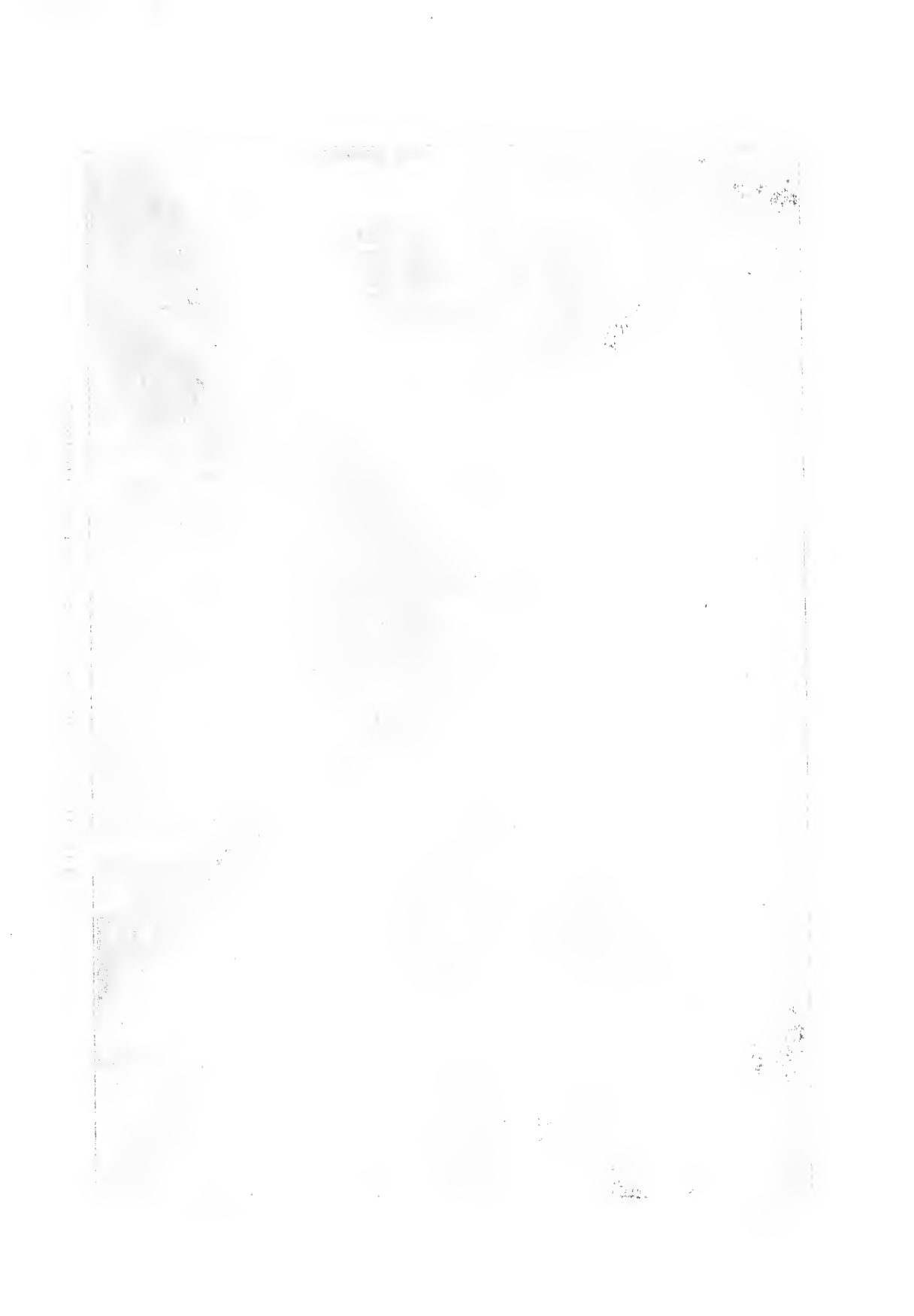
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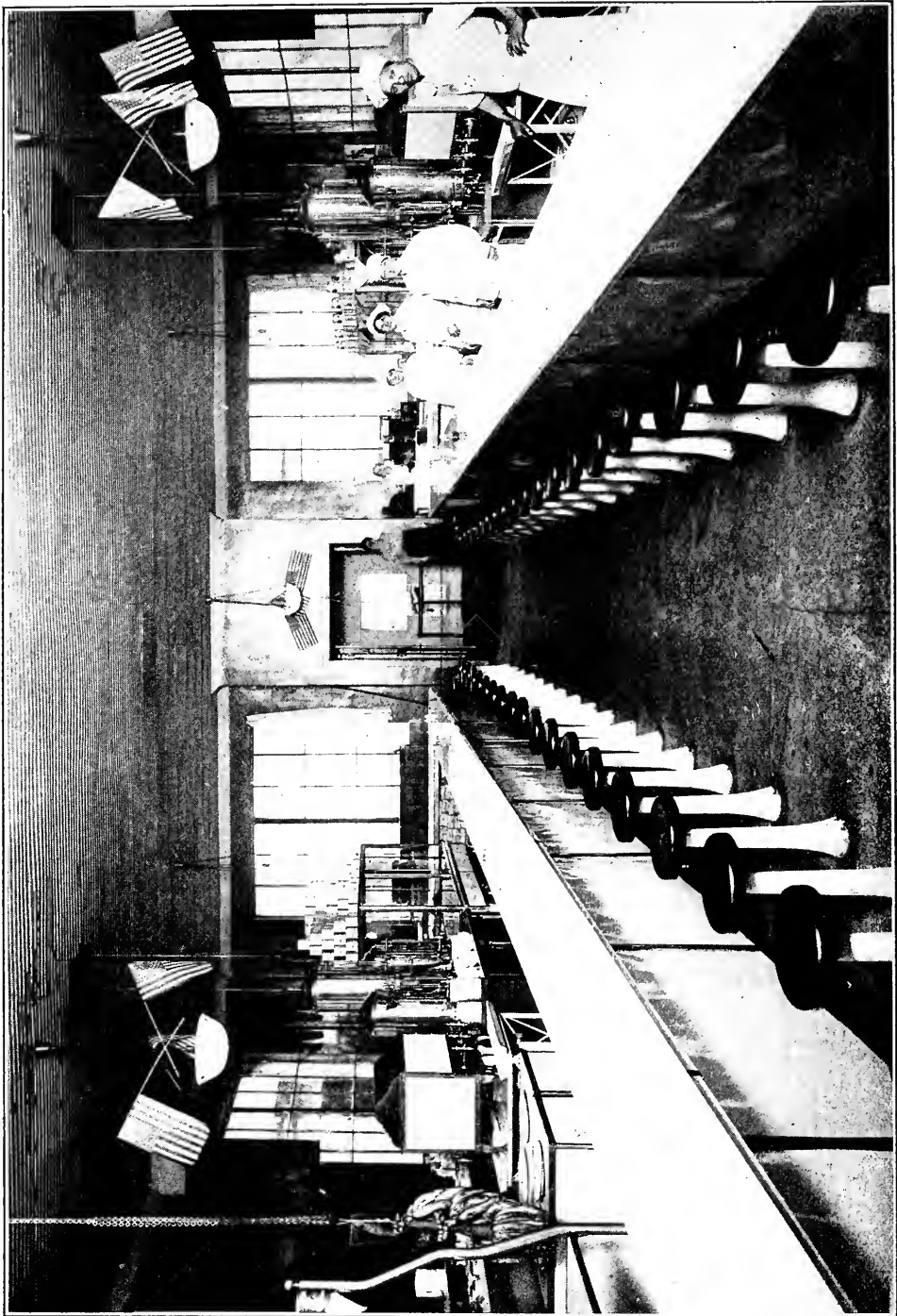
The head of the commissary closely co-operates with the other department heads and representatives concerned with the health, sanitation, and safety of the workers. He is a member of the central safety, sanitation, and service committee, and participates with the plant's representatives in formulating the policies which will care for the health, comfort, and safety of the workers. He also co-operates with the chief physician in safeguarding the sanitation of the commissary.

A system for a daily score-card inspection of the sanitary conditions in the restaurants, mess halls, and kitchens, under the supervision of the plant physician, has been planned, and is being put into operation.

SALES

At the present rate of sales for each check the commissary sales will amount to about \$1,000,000 annually. The laborers are being served with a very substantial meal for from 20 to 35 cents, though the average check among the laborers per meal is between 17 and 18 cents. On March 15, 2,500 people were served, and the sales amounted to \$642.53. In the two mess halls at the present time used by the laborers about 2,000 persons are being fed.





LUNCH COUNTER, AMERICAN SHEET AND TIN PLATE COMPANY

CONSTRUCTION OF BUILDINGS FOR SHIPYARD OR OTHER INDUSTRIAL LUNCH ROOMS, CAFETERIAS, AND RESTAURANTS¹

The cafeteria or self-service plan would appear to be best adapted to the special requirements of most shipyards. The plans here submitted, showing general layouts and details have, therefore, been copied or adapted from cafeterias in successful operation in a variety of American industries and institutions. The drawings with the accompanying notations are merely intended as helpful suggestions. Obviously, the size, type of construction, material and cost will be largely dependent upon the location of the plant, the most readily available building material and the number of persons to be accommodated.

Plan No. 1 is sketched from the cafeteria lunch room of the United States Bureau of Engraving and Printing, Washington, D. C. As sketched, this plan is a four-way cafeteria, two ways—one on either side—are for persons electing to take the combination dinner; and two ways—also one on either side—are for persons who prefer to select their entire lunch or supplement a brought lunch. The central location of the kitchen and the wide passageways are among the many excellent features incorporated in this plan.²

CANTEEN CONSTRUCTION AND EQUIPMENT

The canteen or dining hall, being the principal apartment, should be arranged with the most convenient methods of egress and ingress for the workers and with direct approach to the serving counter, so that traversing the whole or any great portion of the dining hall to obtain food is avoided. Barriers in front of the counters are advisable to allow of each diner obtaining his or her food in the order of arrival, so that there may be no possibility of crowding or pushing, which is sometimes frequent where large numbers are concerned. Adequate gangways or passageways for each diner to proceed to the dining tables without interruption to other diners are essential. The kitchen should be situated as centrally as possible with regard to the dining room, which it should adjoin. The wash-up or scullery should open out of the kitchen and should abut immediately upon the main dining hall. A counter or shelf with communicating hatch should be provided to admit of dirty crockery being handed direct to the hot-water sinks. In addition to the sinks in the scullery, such accommodation is also required in the kitchen for the use of the cook in the preparation of food. The sinks should be supplied with hot water from an independent boiler, which should be placed as near as practicable to the sinks. The sanitary accommodation for the canteen should preferably be situated in an isolated block of buildings adjacent to the canteen, but the requirements in this respect depend upon the sanitary accommodation already existing in adjoining buildings, and each case will have to be considered on its merits. (Health of Munition Workers' Committee, Report on Industrial Canteens—Construction and Equipment, London, 1916.)

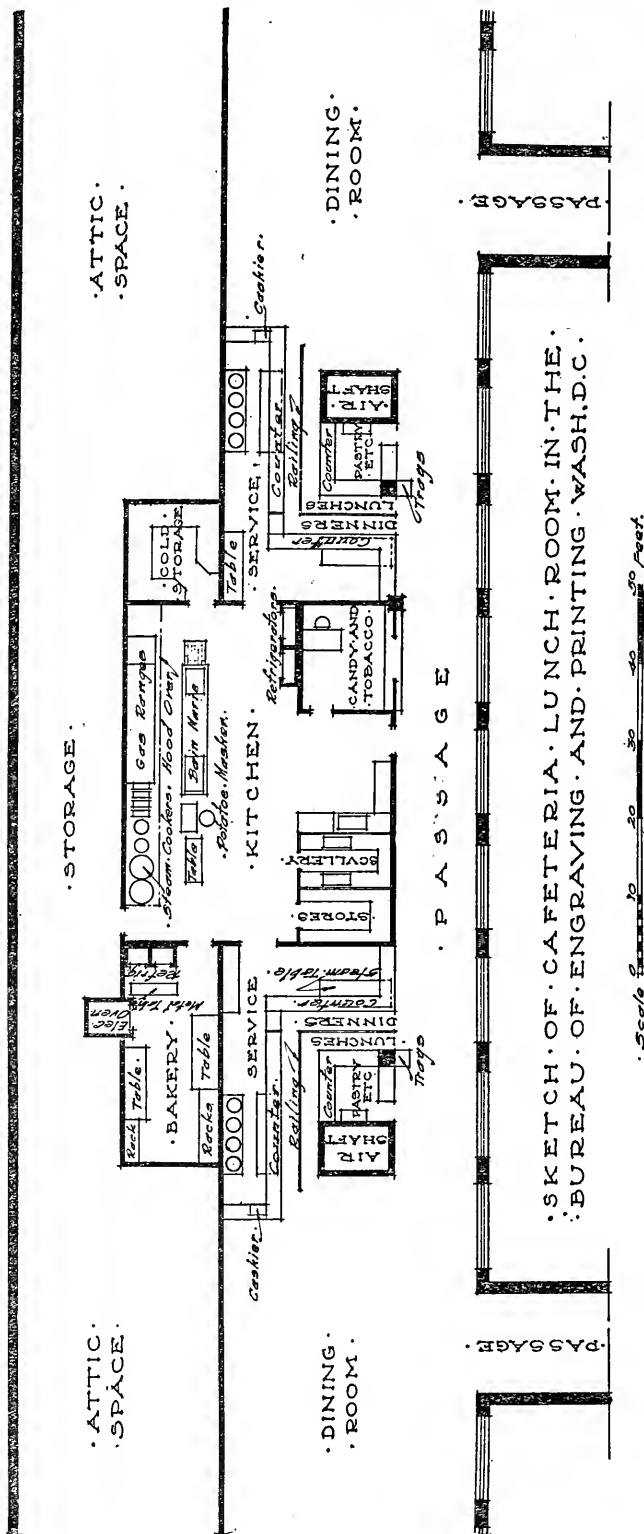
Plan No. 2 is an adaptation from Plan No. 1, showing how the separate counters for regular dinners and selective lunches can readily be extended. Belt conveyors for carrying the trays as they are being filled with the articles making up the table d'hôte dinner are illustrated on this and the following plan, No. 3. The belt conveyor is a unique and practical mechanical aid which will doubtless meet with great success and approval, if properly installed and correctly manipulated. It consists of a slowly moving belt upon which the diner places his tray as he enters the aisle for his table d'hôte dinner. (It is assumed that he is willing to take the dishes prepared for the regular combination dinner, when he enters that aisle; the menu and price being given on the bulletin at the entrance.) He then follows his tray as it moves along and is filled with the various dishes by the attendants on the other side of the belt. The moving belt arrangement is not well adapted for a selective lunch service as the patrons require more time to select the dishes wanted than would be possible with the endless belt contrivance.

The belt conveyors, running along the outside, rear walls of the dining rooms, will facilitate the work of getting soiled dishes, etc., back to the scullery and thence to the serving sections. The tables where the dishes are deposited from the belt should be of the sanitary-scrap type. Conveyors, in restaurants of long dimensions, have been in use in some cities for a number of years, and have proven to be highly practical and satisfactory in every case where they have been installed properly.

¹This section, pages 11-35, has been prepared, for the most part, by Mr. Walter De Mordaunt, Architect, Statistical Section, Emergency Fleet Corporation.

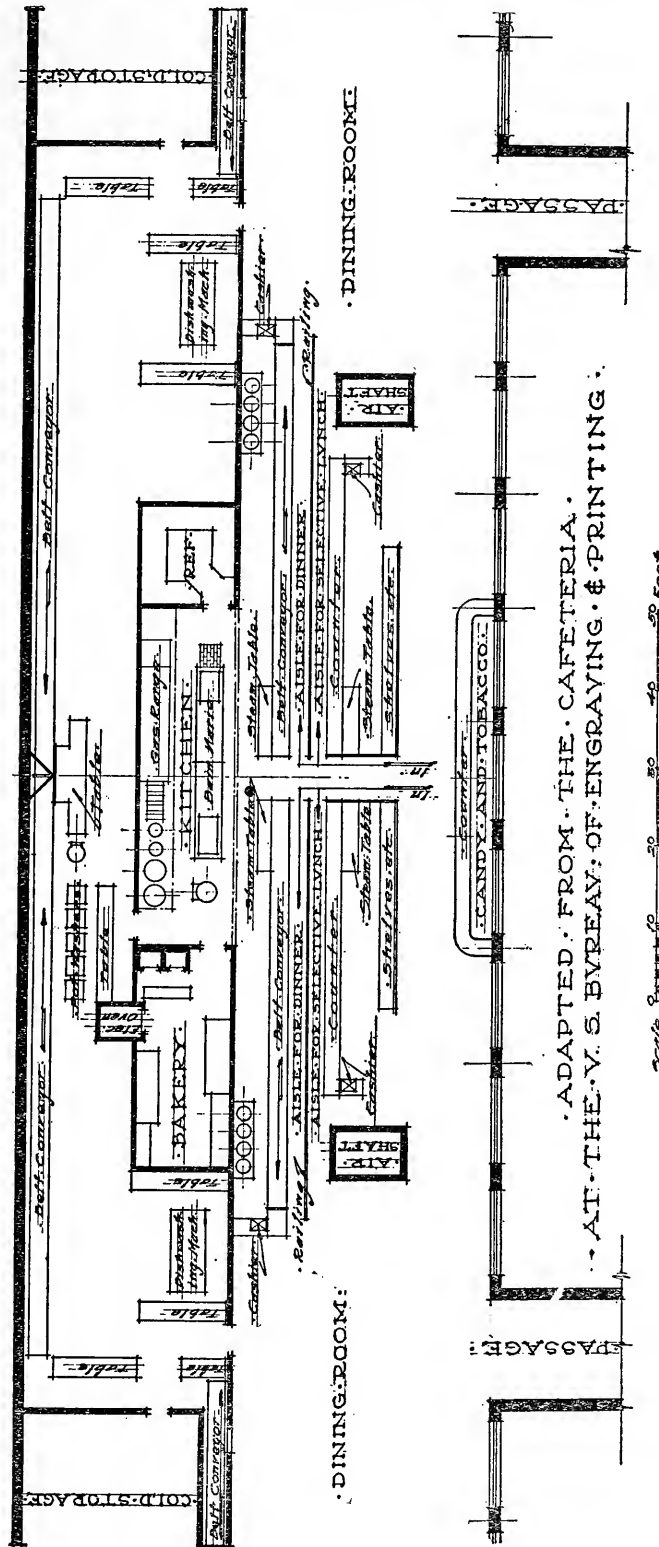
²For a somewhat detailed description of the management and operation of this cafeteria, see *Welfare Work for Civilian Employees of the United States*, by Augustus P. Norton, Monthly Review, Bureau of Labor Statistics, U. S. Department of Labor, Washington, D. C., August, 1918, pages 218 to 220.

Plan No. 1



SKETCH OF CAFETERIA LUNCH ROOM IN THE
BUREAU OF ENGRAVING AND PRINTING WASH. D.C.

Plan No. 2



BELT CONVEYORS

The advantages to be gained by using belt conveyors for carrying materials in a restaurant are chiefly time and labor saving. The small amount of power required for their operation, their large carrying capacities, the smoothness and noiselessness with which they run and the little attention which they require, together with the non-injury to the material carried, all are advantages that will be sure to result when the entire belt system has been properly designed, constructed and maintained.

The speed, number and size of supports, construction and size of terminal pulleys and kind and size of belting best suited to perform the work of carrying food or dishes will all have to be considered in designing any particular system. The following general statements and tables covering the above points are given as suggestive aids. The materials best suited and the sizes most practical have been arrived at by engineers who have studied actual cases for a number of years and have produced perfectly working and highly satisfactory belt or band conveyors.

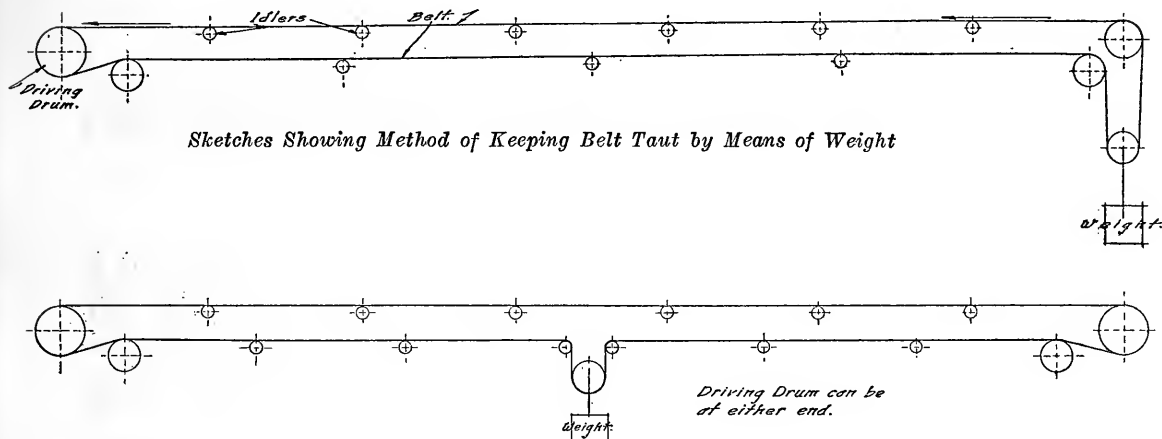
Evidently the most important part of any belt conveyor is the belt. Stitched canvas or woven cotton, saturated with some oily substance to protect the belt against moisture and the wearing and deteriorating effect caused by water or moist substances coming in contact with the belt, is sometimes used on temporary or cheap conveyors. This type of belt is not recommended for any conveying system where highly satisfactory results are desired or where the system is to be comparatively permanent. The most satisfactory belt would be a rubber one, but since this material is prohibitive on account of cost, it is considered most economical and practicable to substitute a composition belt built up of cotton duck and rubber. The cotton duck foundation is covered with a rubber solution or "friction" and after the layers are pressed together the whole is enclosed in the rubber covering which is somewhat thicker on the carrying side. The belt is then stretched and vulcanized. Belts from 12" to 14" wide should not be less than three-ply in thickness; from 16" to 20" wide they should not be less than four-ply, and 30" to 36" not less than six-ply. A good belt of this kind will have a breaking strength of about 400 pounds per ply per inch. The working strength could be figured at about 40 pounds per ply per inch. The actual tension for these restaurant belts will in most cases average about 25 pounds per inch per ply. In actual practice the thickness of belt required will depend upon its tendency to sag between the supports or idlers due to the load which it is carrying. The sizes given in the following table have been arrived at by studying actual cases.

SIZES FOR BELT CONVEYOR PARTS

All Dimensions are given in Inches

Width of Belt.	No. of Plies in Belt.	Width of Pulleys and Rollers.	Diameter of Driving Pulley.	Diameter of End Terminal Pulley.	Diameter of Tightening Pulley.	Diameter of Idlers.
10	3	12	15-18	12-15	12	4
12	3	14	15-18	12-15	12	4
14	3	16	15-18	12-15	12	5
16	4	18	21-24	15-18	15	5
18	4	20	21-24	15-18	15	6
20	4	22	21-24	15-18	15	6
22	5	24	24-30	18-22	18	6
24	5	26	24-30	18-22	18	8
26	5	28	24-30	21-24	18	8
28	5	30	24-30	21-24	18	8
30	6	33	30-36	24-30	21	8

Next in importance to the belt comes the terminal rollers and particularly the driving terminal. If this pulley is too small it will strain the belt and wear it out more quickly than if a larger pulley were used. The driving pulley is the drum to which the driving power is applied. It can be made of wood or iron and should be well rounded on the face. Care should be taken that no sharp projections are present on the face of the pulleys. The terminal at the end opposite the driving terminal should be made a trifle smaller and may be fitted with an adjustment for keeping the belt taut. For short belts this method of keeping the belt taut has been found very satisfactory, but for long conveyors the weight tightener as illustrated in the accompanying figure is recommended. If used at the end, this weight should be at the terminal opposite the driving pulley.



Theoretically the size of idlers should be governed by the speed at which they revolve, that is, for fast-running belts pulleys or idlers should be large, while for slow-running belts they may be made smaller. As a rule they will be about 4 to 6 inches in diameter and constructed of wood, or they may be made of steel tubes with conical end gudgeons running in bush bearings. If ball bearings can be used they are much to be preferred to any other kind since they require so little attention. The idlers should be about 4 feet apart, but may, with safety, be placed as much as 8 feet on centers, provided the tension on the belt is enough to keep it taut and the belt itself is thick enough. If the return strand is not used for conveying material the idlers may be placed twice as far apart as for the upper strand. To prevent side movement of the band on the rollers the use of one or more pairs of small rollers placed against the edge of the belt may be necessary. However, this should not be necessary and will not be if the belt is well made and the idlers and terminal pulleys are all true and parallel.

The speed of the belt for carrying soiled dishes to the scullery may be from 150 to 250 feet per minute, while that for serving food should be about 200 feet per minute. This serving belt should be about 3 feet 2 inches from the floor and should be provided at the end with a shelf or throw-off onto which the tray of food slides.

The power required to operate the belts will be found to be very small. For a belt 100 feet long, traveling at a speed of 100 feet per minute and loaded with dishes, the following horsepowers will be required:

TABLE OF HORSE POWERS FOR BELTS OF VARIOUS WIDTHS

10" Belt	.....	.80	Horsepower
12" "	.....	.85	"
14" "	.....	.96	"
16" "	.....	1.35	"
18" "	.....	1.50	"
20" "	.....	1.85	"
22" "	.....	2.10	"
24" "	.....	2.50	"
26" "	.....	2.68	"
28" "	.....	2.87	"
30" "	.....	3.30	"
32" "	.....	3.80	"
34" "	.....	3.95	"
36" "	.....	4.45	"

The belt unloaded will require 75 per cent. of the horsepower necessary to run the loaded belt.

The return strand of the serving belt may be used to carry dishes back to the kitchen and, if used in this way, should have a plain board throw-off placed at an angle with the line of action of the belt for sliding the dishes off the belt and onto a sanitary scrap table.

PLAN NO. 3.—A LARGE INDUSTRIAL CAFETERIA

The total floor area of the building which this drawing would represent, if adopted, would be about 24,000 square feet. The length over all would be 402 feet, and the greatest width 72 feet. The two main dining rooms would each measure about 50 by 160 feet. The total seating capacity would be approximately 1,480 and, with the service belt conveyor facilities, 5,000 or more men could be accommodated in not longer than 1½ hours. This would allow a little more than 25 minutes for each man.

Strictly speaking a cafeteria is a restaurant where patrons wait upon themselves, but in actual practice it is found that the efficiency is increased and more satisfactory results are obtained when waiters are employed to assist in dishing out the food asked for and to help the patron in making his selection by pointing out and calling his attention to the various articles. In our "large industrial cafeteria" food is served quickly, quietly, with freedom of motion, and in a clean, appetizing manner by the co-operation of the workmen, attendants, and the mechanical appliances. The belt conveyor system for the aisles in which table d'hôte dinners are obtained is well illustrated in this plan.

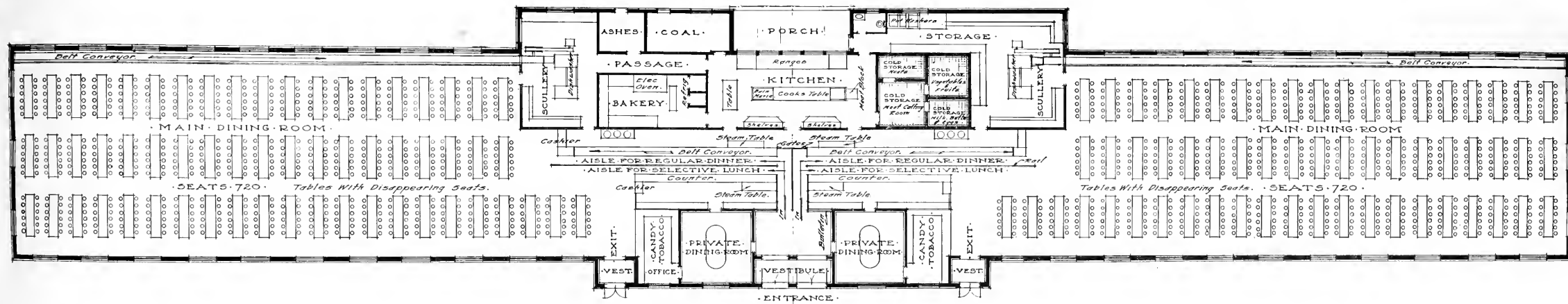
For those who do not care for the regular dinner and who, for some reason, would prefer to make their own selections, another service is provided where articles of food, such as bread, meats, salads, sandwiches, pastry, desserts, coffee and soft drinks can be obtained over a counter. The private dining rooms will be used by officials, clerical staff, visitors, etc.

The candy and tobacco showcases could be in charge of the cashiers. This is a better system than to have cashiers stationed at the ends of the service aisles, because men paying their bills at that point would tend to obstruct the line behind them. The plan used most in busy cafeterias is for checkers, who are at the end of the counters, to give each patron a small check indicating the amount to be paid the cashier on leaving the establishment. Checkers become so familiar with the prices of the various dishes that they are able to hand out the proper checks without delaying the movement of the line in the least.

The manager of the lunch room would, no doubt, find a place for his desk in the space inclosed by the candy counters. Meal tickets or books of tickets of



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• A LARGE INDUSTRIAL CAFETERIA •

• FLOOR PLAN •

Scale 0 10 20 30 40 50 Feet.

PLAN NO. 3

• WALTER DE MORDAUNT, DEL.
• FOR THE •
• EMERGENCY FLEET CORPORATION

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different denominations might be sold to the workmen. The fact that some workmen do not make a practice of carrying money in their working clothes would make this ticket plan worth considering.

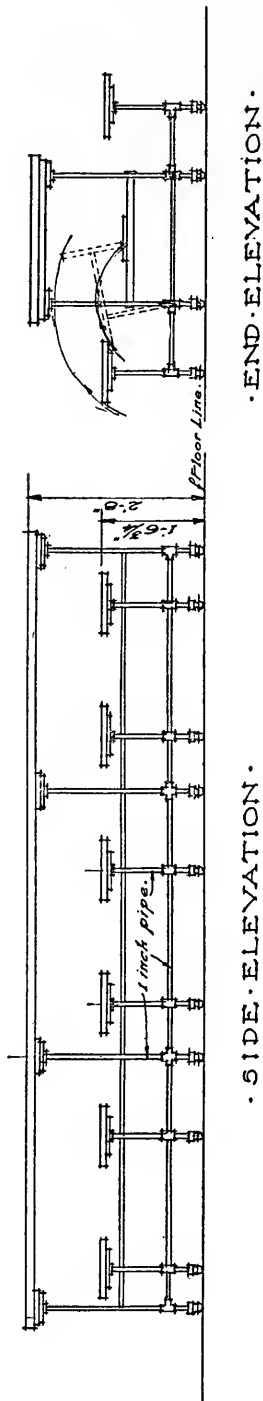
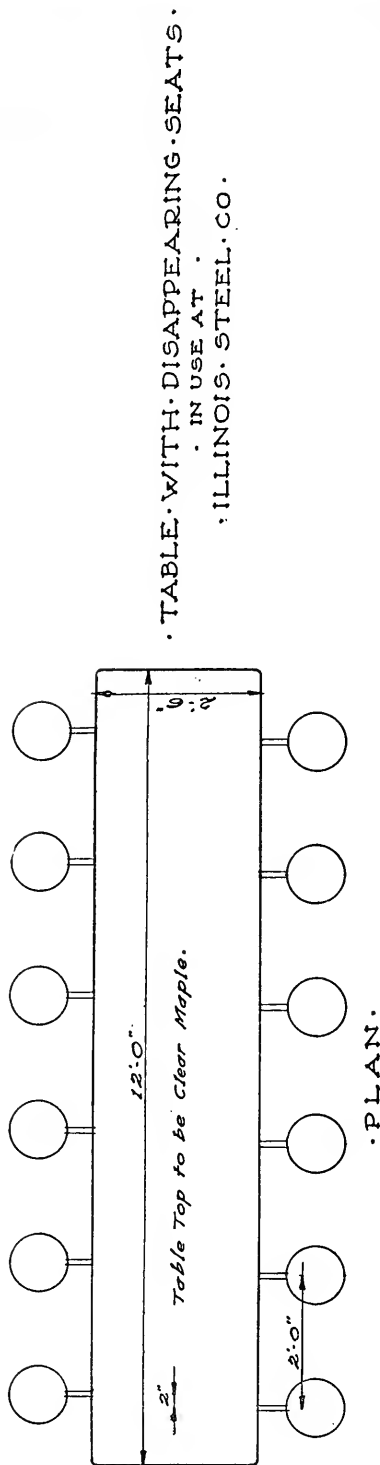
The building should, if possible, face south or southwest, which would place the storage and kitchen on the north or shady side, and the dining rooms in a cheerful position with respect to the sunlight.

Detail No. 1 suggests a type of table well adapted for large cafeterias. The present cost of such a table would probably be from \$40 to \$50. This style of table is used at the Illinois Steel Company's works and this drawing has been included because it is felt that many plants will desire good, strong, sanitary, serviceable tables of this type. The table top and stools are of clear maple; inch and five-eighths stuff being used for the top and inch and three-eighths for the stools. The balance of the table consists of 1-inch standard pipe and fittings and some special connections. The stools revolve around a 1-inch pipe which extends from one end of the table to the other on each side. When not in use they are swung up under the table, resting on a 1 x 8 inch wood rail. It will be noted that the stools on one side are staggered 2 inches off center with those on the other side. A working detail of this table, (Detail No. 2) with bill of material, follows:

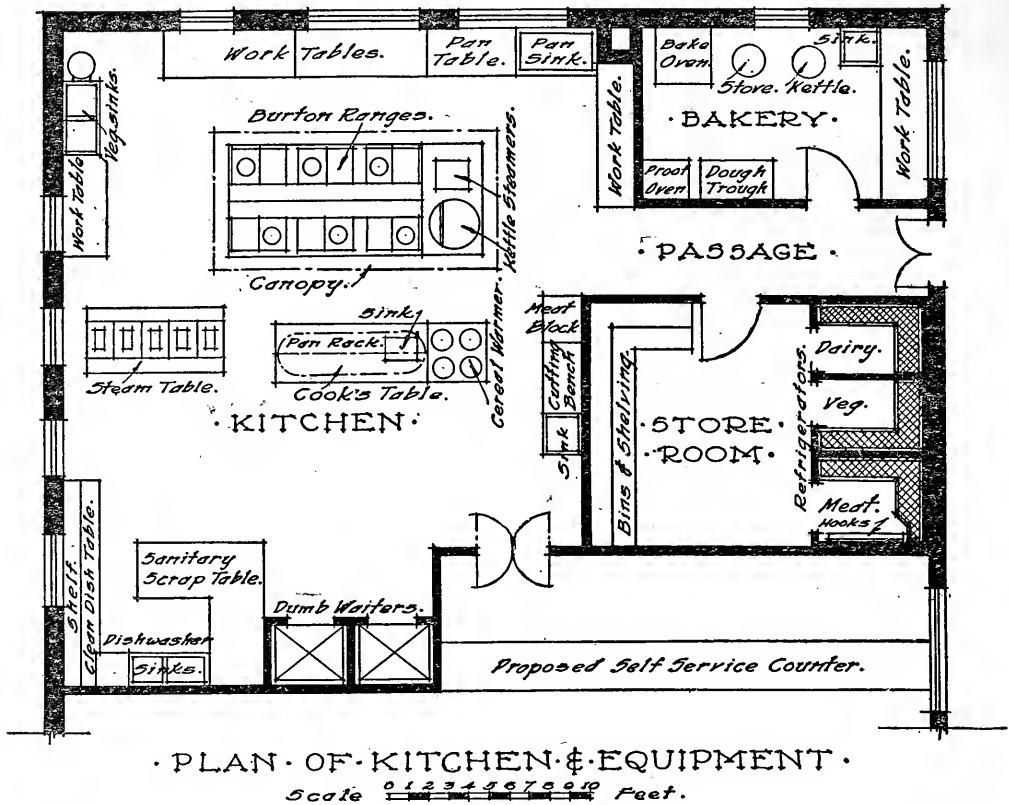
BILL OF MATERIAL FOR ONE TABLE WITH 12 SEATS

Mark	No. Req'd	Description	Material	Remarks
Table Top Strip				
A.	15	1 $\frac{5}{8}$ " x 1 13/16" x 12'-0" long finished	Maple	See Detail.
Cleat				
B.	4	5 $\frac{3}{4}$ " x 1 $\frac{1}{4}$ " x 2'-4" finished	Oak	See Detail.
Seat				
C.	12	1 $\frac{3}{8}$ " x 11" (Diam.) finished	Oak	Polished.
D.	1	$\frac{7}{8}$ " x 7 $\frac{1}{2}$ " x 11'-10" board-finished	Oak	
E.	12	1" x 6" (Diam.) flange	Cast Iron	
F.	8	1" x 4" (Diam.) comp. flange	Cast Iron	N. T. Co. Cat. Fig. #J-579. See det. for drilling.
G.	12	1" Standard screwed Tee-plain	Mall. Iron	N. T. Co. Cat. Fig. #J-114.
H.	12	1" Standard screwed Tee-beaded	Mall. Iron	N. T. Co. Cat. Fig. #J-115. See det. for drilling.
J.	2	1" St'd fourway Scr. Tee-plain	Mall. Iron	N. T. Co. Cat. Fig. #J-121.
K.	2	1" fourway scr. Tee-plain	Mall. Iron	N. T. Co. Cat. Fig. #J-121. See det. for spec. tapping.
L.	4	1" St'd scr. Cross-plain	Mall. Iron	N. T. Co. Cat. Fig. #J-122.
Table Top Edge				
M.	1	1 $\frac{5}{8}$ " x 3 $\frac{1}{4}$ " x 12'-0" long	Maple.	Grooved on one side.
N.	1	1 $\frac{5}{8}$ " x 3 $\frac{1}{4}$ " x 12'-0" long	Maple.	See Section A-A. Tongued on one side.
Foot				
O.	20		Cast Iron	See Section A-A.
N.	4	1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{1}{8}$ " angle x 2'-1 $\frac{1}{2}$ " long		
P.	75'-0"	1" Standard Pipe	Steel	Cut and thread to suit.
AD.	44	$\frac{1}{4}$ " x 2 $\frac{1}{2}$ " lag screws	Steel	With washer.
Q.	8	5/16" (Diam.) x 2" bolt	Steel	Hex. Head and nut.
R.	8	5/16" (Diam.) x 1 $\frac{1}{2}$ " Carr. bolt	Steel	
S.	68	#14 x 1" R. H. Wood-screws	Steel	
T.	24	$\frac{1}{4}$ " (Diam.) x 1 $\frac{3}{4}$ " Pin	Steel	Taper to drive.

Detail No. 1



Plan No. 4



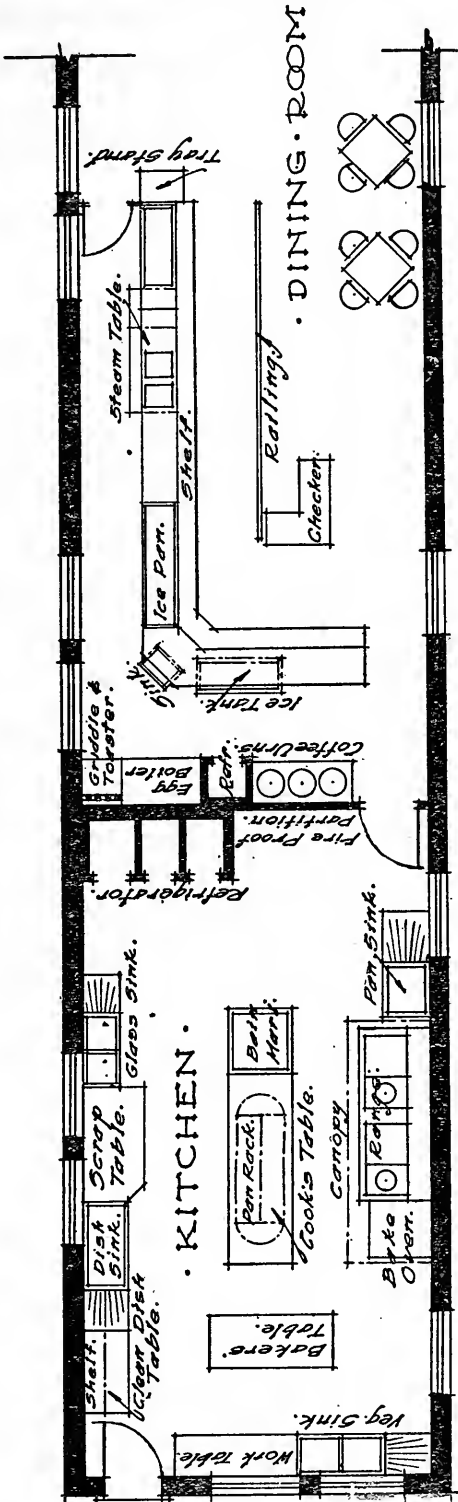
FROM A MODERN HOSPITAL.

A few parts of this plan would require alteration and rearrangement to meet the problems which will be found to exist in shipyards, and which are not common to hospitals.

The main entrance to the dining room should be located at a point near the self-service counter. An exit, or exits, should be provided at the end of the dining room opposite the kitchen. The dining room could be built any size up to the capacity of the kitchen.

An admirable feature of this plan is the arrangement of the refrigerators. This system of separate compartments makes it possible to store milk, butter, and eggs; meats; fruits and vegetables all separate and apart from each other. If not prohibitive on account of cost, the flooring in these refrigerators and in the storeroom should be of vitreous tile. A perfectly sanitary condition ought to prevail in all storerooms and refrigerators. The base should be a 6-inch sanitary tile cove base, and the walls should have a Keene's cement wainscoting up to a height of at least 6 feet, this wainscoting to be marked off neatly into blocks 3 by 6 inches and finished at the top with a simple dado mold of Keene's cement. All exterior and interior corners should be rounded or cove corners. The room and refrigerators to be thoroughly ventilated by openings in the outside wall, covered with No. 8 wire mesh. The openings to be within 6 inches of the floor and the same distance down from the ceiling. These openings

Plan No. 5



PLAN OF KITCHEN & SELF-SERVICE EQUIPMENT.

Scale 0 1 2 3 4 5 6 7 8 9 10 Feet.

should also be covered with a fine mesh screen (sixteen strands to the inch) as a protection against flies and mosquitoes.

The dumb-waiters will, of course, be eliminated. The steam table should be placed in the space behind the self-service counter instead of in the kitchen, as indicated on the plan. A wicket ought to be built in the wall over the sanitary scrap table for the passage of soiled dishes from the dining room into the kitchen.

The entrance to the kitchen should be on the north if possible. This would place the storage section on the north, which is the logical location.

PLAN NO. 5

This plan, like the preceding, would be best adapted to comparatively small cafeterias. The kitchen could, of course, be used to serve two dining rooms, one on either side.

The disposition of different parts of the cooking apparatus varies with the type of apparatus used, but, generally speaking, it has been found most convenient to have the stoves and roasters in the center of the kitchen, with the steamers or boilers behind, and the carving table and hot closets adjacent to the serving counters. (Feeding the Munition Worker, p. 12, London, 1916.)

PLAN NO. 6.—MESS HALL, MILITARY SCHOOL OF AERONAUTICS, ITHACA, N. Y.

This drawing represents a building designed for the use of students at the military school of aeronautics, at Ithaca, N. Y., and, therefore, some problems involving different conditions prevalent at shipyards will have to be considered and solved in order to render the plan, which is merely suggestive, practicable for use at these plants.

The central position of the kitchen with respect to the dining rooms is a good feature of this plan. The elastic or expansive possibilities which this type affords is another feature in favor of its adoption. Some rearrangement of entrances and exits may be necessary to make the plan adaptable to whatever system of paying for meals is decided upon. Also, it may be necessary to rearrange smaller details of the serving counters to take care of checkers, cashiers, etc.; and railings inclosing aisles along the counters would tend to maintain lines in good order while food is being served to workers.

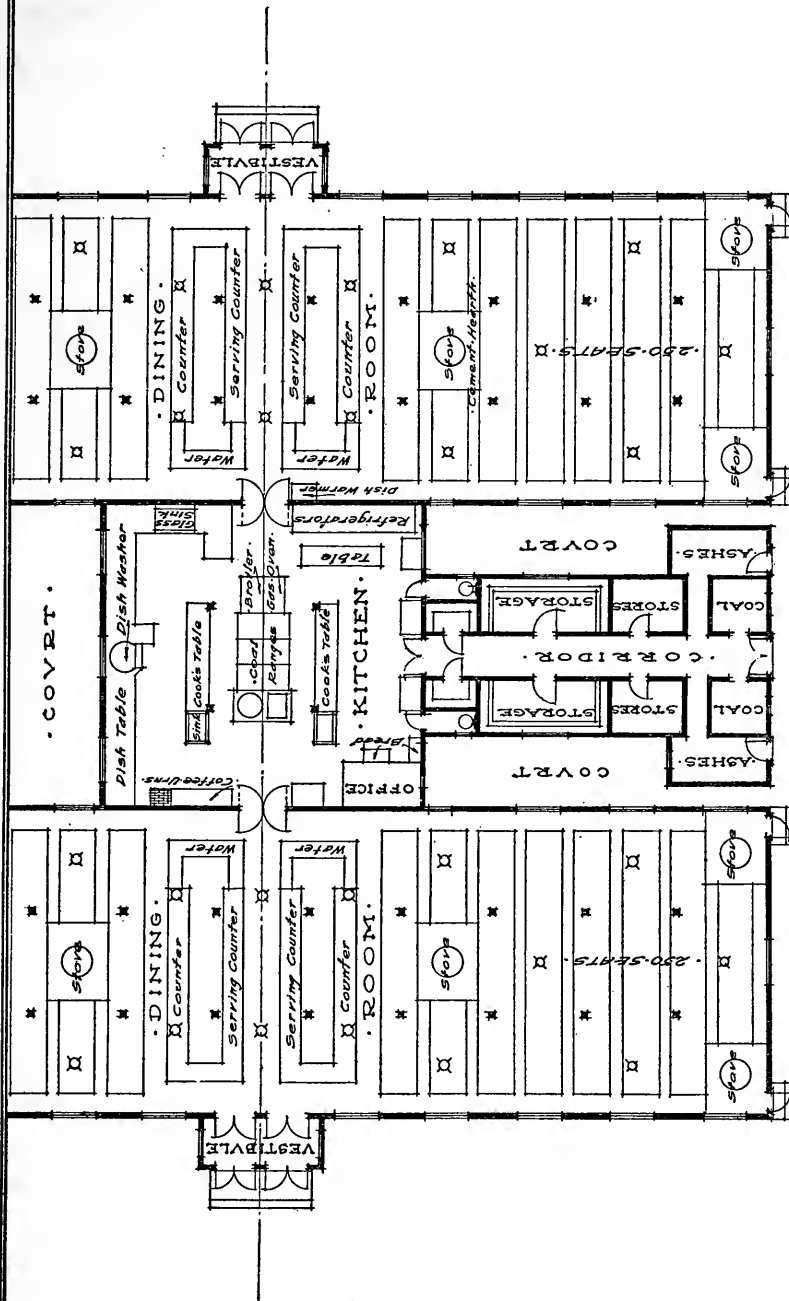
The coal and ash rooms should be next to the kitchen instead of at the places where shown. The light courts, if not obstructed by these ash rooms, will be wide enough to admit coal and delivery trucks.

The refrigerators ought to be as close and accessible to the kitchen as possible. They should be so divided by air-tight partitions that milk, butter, and eggs; meats; fruits and vegetables can be stored apart from each other.

Another room should be planned in conjunction with the kitchen to be used as a bakery, this bakery to contain the following equipment: A bake oven (electric if possible); a proof oven; a pastry stove; a kettle; a sink; a dough trough; work tables; a metal table; and the necessary racks for pies, pastries, etc., together with bins and other storage cases, and, if possible, a portable refrigerator.

It might be found advisable to do away with parts of court spaces, or all of these spaces for that matter, in order to enlarge the dining rooms, kitchen, or for some other reason. In the event that this were done, the outside wall areas available for windows being thereby reduced, it would be possible to light the kitchen from above by roof lights, which would be a very desirable and efficient manner of illuminating and ventilating this room. If this restaurant should be erected between the ways, which should not be done if avoidable, proper

Plan No. 6



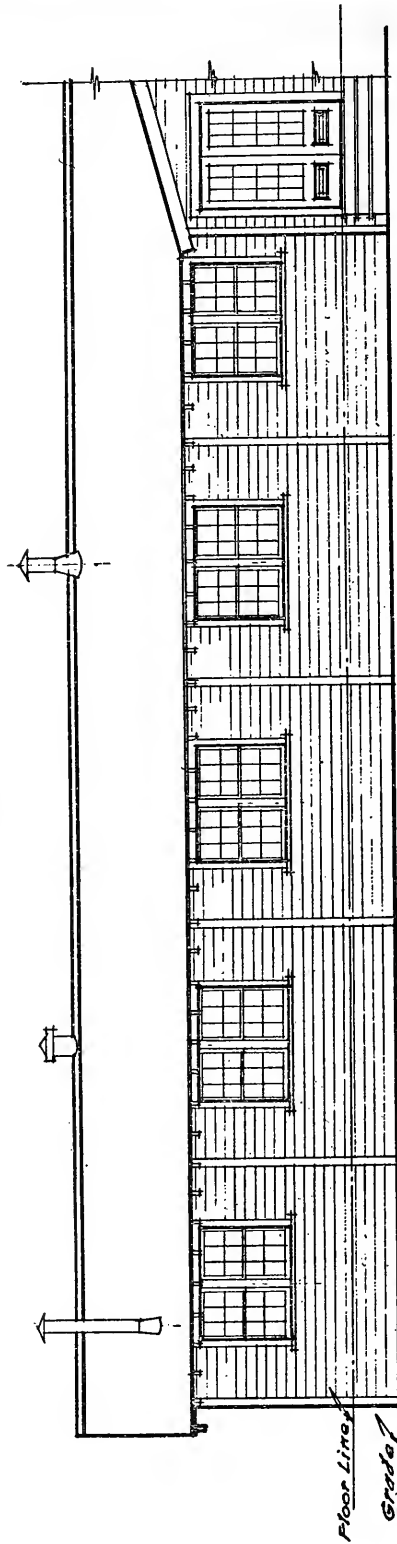
FLOOR PLAN.

SCALE: 1/8" = 1'-0"

Scale 0 10 20 30 Feet

A. MESS HALL.
AVIATION SCHOOL.
ITHACA, N.Y.

Detail No. 3.



· HALF · FRONT · FACADE ·

· MESS · HALL - ITHACA, N.Y. ·

protection from falling rivets, etc., should be given the skylights by erecting heavy mesh screens over them.

In the dining room, wickets or openings should be left in the walls near and over the dishwashers' tables for the passage of soiled dishes from the dining room into the kitchen. Tables with disappearing seats, as detailed elsewhere, (see pages 17-19) would be an added advantage over the tables now in use in these dining rooms. The "swing" of the doors might be altered with better results obtained than if swung as here indicated.

The provision on the plan for candy and tobacco counters should be considered, as this feature brings added revenue and, of course, supplies a natural demand.

Heating by steam or hot water, using coils or radiators along the outside walls under the windows, with the supply of heat from a central plant, if possible, would be a decided improvement over the stove system indicated. The amount or number of square feet of radiation required depends upon the geographical location of the plant and the character of construction employed, together with the cubical contents, total exposed wall area, and the total glass area of the room to be heated. If these conditions are stated this department will be glad to furnish, upon request, the amount of radiation surface necessary for either a steam or hot-water system.

We would suggest that the storage part of the building be placed to the north, since it would then be less exposed to the heat of the sun.

DETAIL NO. 3

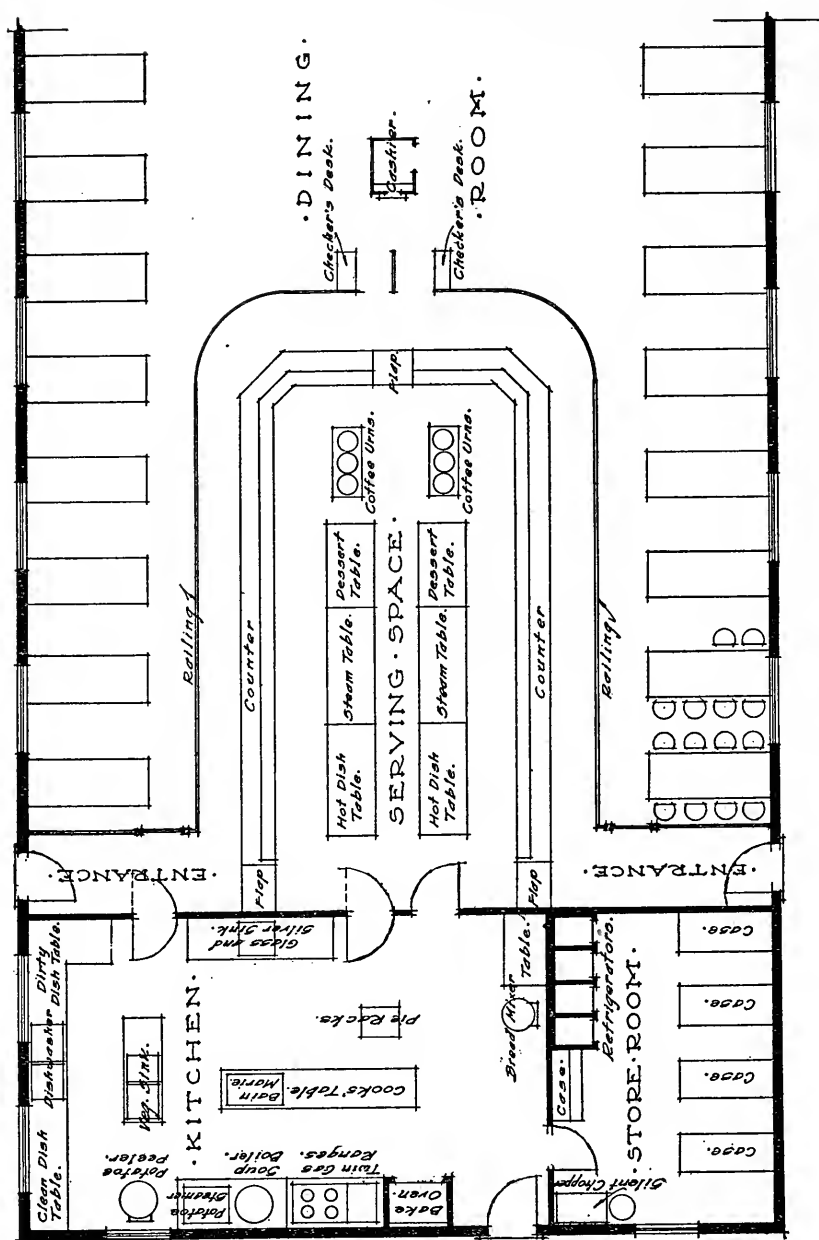
This detail shows the excellent natural light and ventilation obtainable by the use of windows placed high toward the ceiling. Swinging windows, as a rule, should swing inward so as not to interfere with full-length screens.

Ample window space (with a large proportion of the windows opening) is desirable for light and ventilation, and in no case should the total glass area of the windows be less than one-tenth of the floor area of the various rooms in which they occur. The fanlights for casement windows should be hinged at the bottom and fall inward. Glazed cheeks or gussets should be provided to admit of continuous ventilation, and at the same time to prevent down draft. All casement windows should be made to open for use in warm weather, and flush the rooms with air after the principal meal. Louver ventilators under the roof or in turrets provide ventilation for the main mess room. A simple cord attachment to wooden flaps should be provided to admit of these ventilators being closed during cold or windy weather. The kitchen should be provided with a continuous louver ventilator. It is desirable, where electric or other power is available, that an exhaust fan should be placed in the kitchen to extract the heat and steam from the kitchen and scullery, and incidentally assist in the general ventilation of the dining rooms. Larders should face north and have nearly half the glass omitted in the window panes and perforated zinc panels substituted to provide suitable ventilation of storage for perishable food. (Health of Munition Workers' Committee Report on Industrial Canteens, "Construction and Equipment," London, 1916, pp. 3-4.)

PLAN NO. 7—ADAPTED FROM THE GLEASON WORKS, ROCHESTER, N. Y.

An entrance on each side of the building admits the men. First, they get their trays, silverware, napkins, etc., and then pass along the counter getting the food they desire, which is all spread out before their eyes so that they may make a selection according to their individual tastes. As they pass out of the space inclosed by the railings they are given a check by the checker. After partaking of their meal, and before passing out, they stop at the candy and cigar counter, where they pay their bill and purchase whatever they care for in this section. The exit should be located near the candy and cigar department and directly in front of the cashier. The cashier's cage, shown on the drawing, if used at all, ought to be at the exit rather than in the position represented on

Plan No. 7.



· FLOOR · PLAN ·

Scale 0 1 2 3 4 5 6 7 8 9 10 Feet.

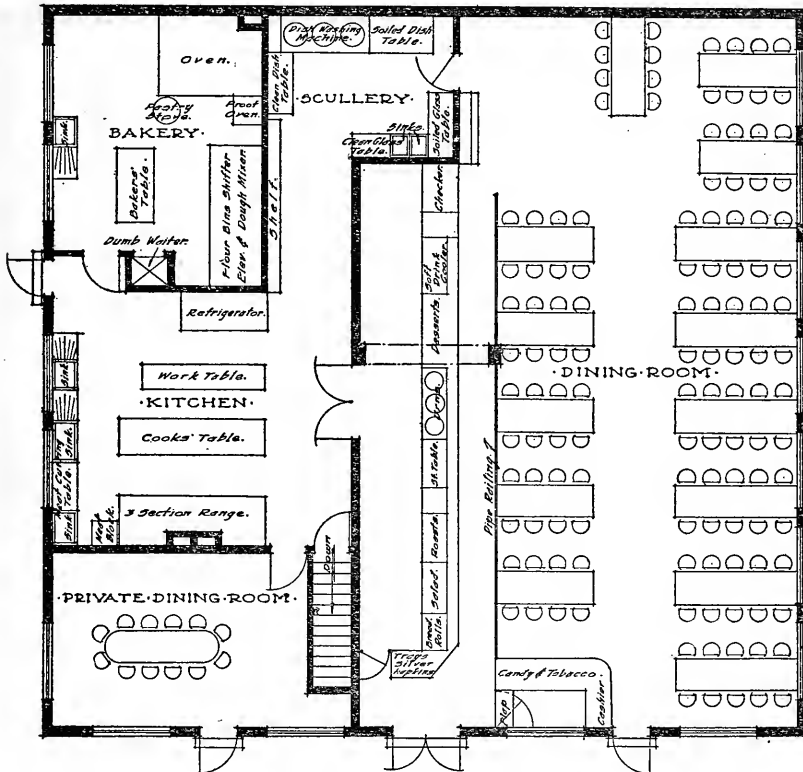
..ADAPTED FROM THE GLEASON WORKS.
 .ROCHESTER, N.Y.

the drawing. The gates in the railings near the entrances are for the use of attendants carrying soiled dishes from the dining room to the kitchen.

The entire dining room is not completed on the drawing, but it could be planned any length to give a total floor area of 10 square feet for each and every person occupying the room. The capacity, however, should not be increased above what the kitchen is designed to accommodate.

A few details of storage cases (Detail No. 4, p. 29) in use at this restaurant are given. Other details of serving counters and tray racks (Detail No. 5, p. 30)

Plan No. 8.



· FIRST FLOOR PLAN ·

Scale Feet.

· FROM · A · RESTAURANT ·
· AT · THE ·
· AMERICAN · TIN · PLATE · CO ·

are also given. Further and more complete working details will be sent upon request. It appears that the refrigerators are hardly adequate for a restaurant of this size. We would suggest that they be placed against an outside wall and be provided with openings therein, top and bottom, for ventilation.

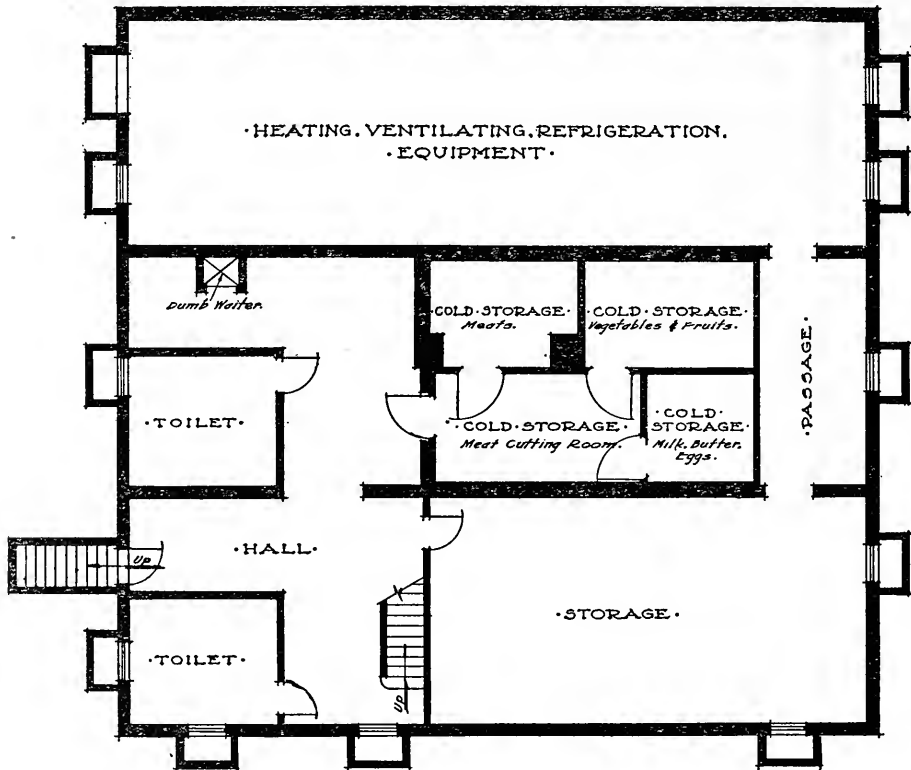
PLANS NOS. 8 AND 9.—FROM A RESTAURANT OF THE AMERICAN SHEET AND
TIN PLATE CO.

The best type of reinforced concrete construction has been used in this building erected by the American Sheet and Tin Plate Co. If a cheaper form

of construction is adopted, it will be necessary to reduce the spans for floor and roof joists to something like 12 feet or less by introducing columns and girders. In that case the columns should be placed at convenient points where they will not interfere with the efficient movement of workers or attendants.

The cold-storage system in the existing building is all in the basement. An excellent system, called the plenum system, for heating and ventilating the entire building, and a refrigeration machine occupy the space next to the cold-storage section. The remainder of the basement is open to much development

Plan No. 9.



• BASEMENT PLAN •

Scale 2 1/2" = 20' 0" Feet.

• FROM A RESTAURANT •
• AT THE •
• AMERICAN TIN PLATE CO. •

and improvement in the way of toilet, storage, and other facilities for use in shipbuilding plants.

If the basement is eliminated altogether, the refrigerators could be placed on the first floor, probably without necessarily increasing the dimensions of the building in either length or width. The space saved by the elimination of the basement stair and the dumb-waiter, together with the utilization of what appears to be waste space in and between the scullery and kitchen, and a slight reduction of the area now occupied by the bakery, would no doubt be sufficient for all the cold-storage facilities required.

The fact that another building is standing adjacent to this one is the reason for the omission of windows in the rear wall. If this same condition is not to be contended with, it would, of course, be well to provide for light and ventilation through this wall, especially in the scullery.

In cases where the first-floor level is far enough above grade to make the use of steps at the entrances and exits necessary, it is always considered better practice to build a stoop or landing at the top of the stair rather than to let the door open directly on the flight.

The private dining room is intended for the use of staff, superintendents, foremen, other officials, and visitors. It would be well if a butler's pantry, or so-called pass pantry, were provided between the kitchen and this dining room for the use of the special waiters and the storage of special silverware, dishes, linen, etc. The pantry would also act as an aid in preventing gases and odors from getting into the dining room from the kitchen. This is an important detail to be kept in mind in planning an exclusive room of this kind.

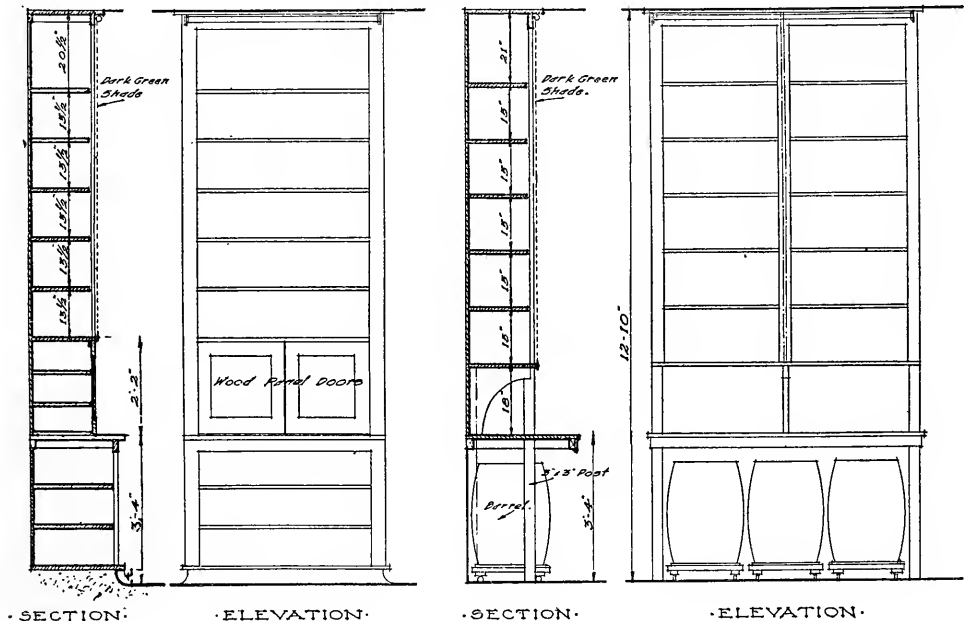
The location of the building is another important matter to consider. The outlook through the dining room windows should be as pleasant as possible, and it should be evident that the building ought to face south, or as nearly so as possible.

BRITISH EXPERIENCE

The following quotations from the admirable report on industrial canteens prepared by the British Health of Mmunition Workers' Committee give some useful information which should be adaptable to American conditions:

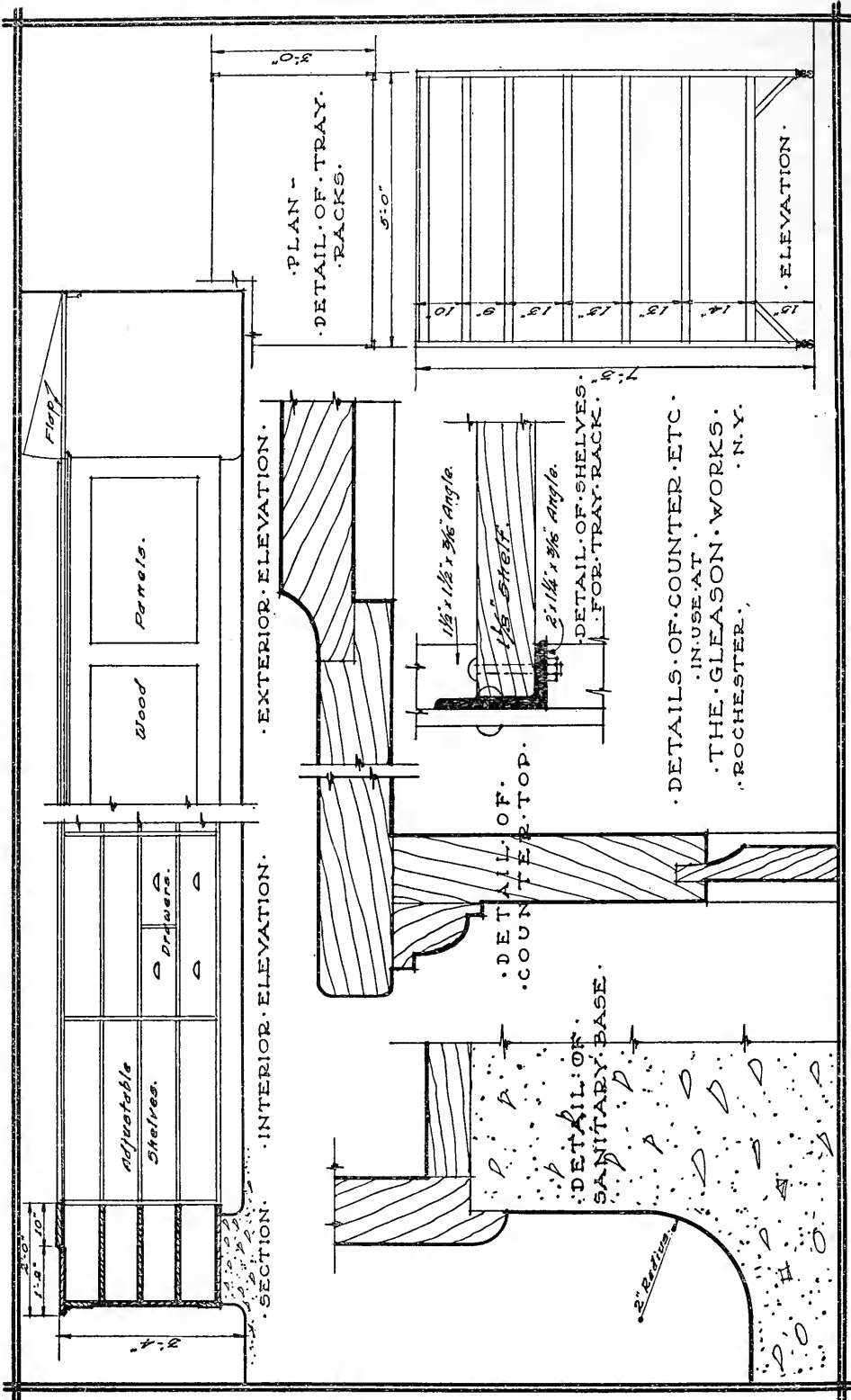
The site is very important; it should be in a central position, easy of access to all parts of the works. The building should not be a barrack, but should have an agreeable and attractive appearance. It should include dining room or rooms, kitchen, scullery, larder, stores, catering office, and sanitary accommodation. The stores, larder, etc., should open upon a yard, with an easy access for tradesmen's carts, etc. As the system of service would be a counter service, the kitchen and scullery should abut direct upon the dining room.

Detail No. 4.



• STORAGE CASES IN USE AT GLEASON WORKS •
• ROCHESTER, N.Y. •

Detail No. 5.



It is suggested that about 8½ square feet per person seated should be allowed in the dining rooms.

The following inexpensive permanent construction has been found suitable:

Walls.—Nine-inch brickwork rendered externally with Portland cement three-fourths inch thick and finished with a rough-cast surface; with large span roofs brick piers of greater thickness will be required under the roof principals; the brickwork internally to be flat pointed with a painted dado to a height of 5 feet (salt-glazed in lavatories, etc.), the brickwork above distempered, no plaster being used.

Roofs.—Boarded and covered with slates, the underside of boarding being painted a cream color.

Floors.—Concrete, with granolithic face.

The store and larder should be fitted with shelving of deal 1 inch thick supported on 2 by 1½ inch framed bearers and uprights. The shelving should be kept 1 inch away from the walls.

The larder should, if possible, face north, and perforated zinc panels should take the place of glass in one-half the area of the windows to provide permanent ventilation.

(Health of the Munition Worker, 1917, pp. 72-73.)

A NEW METHOD OF CONSTRUCTION

A splendid system of cheap but durable construction has been devised and perfected by a New York firm of architects and engineers, and is described in the April 3, 1918, issue of the *American Architect*, by Mr. William E. Groben. Drawings illustrating the method are also given. Mr. Groben says in part:

In order to meet the scarcity of building materials, principally brick and lumber, Mr. E. G. Perrot, of the firm of Ballinger & Perrot, architects, of New York and Philadelphia, has devised and perfected a system of construction which makes the erection of large numbers of permanent and durable houses in record-breaking time a possibility. This type of construction is styled the concrete stud and cement stucco construction.

He then goes on to describe and explain the construction, and to point out its advantages from a time-saving as well as from an economical and serviceable point of view, because—

In this type of construction, reinforced concrete is substituted for masonry walls; not, however, of the poured monolithic system customarily used heretofore, nor the precast concrete method, but by applying the concrete either by hand or by means of the cement gun. Concrete is particularly adaptable to this form of construction because it is permanent, fire-resisting, sanitary and waterproof; and when used in the large scale operations contemplated at the present time, it makes for maximum economy by employing labor-saving machinery and re-using equipment. Furthermore, concrete is generally a more nearly local building material than any other, and its use not only materially assists in relieving the already overtaxed transportation facilities of our country but also eliminates the delays in construction due to embargoes and irregular shipments.

It is confidently felt that the concrete stud and cement stucco construction is without exception the cheapest and best method to be employed for the quick erection of industrial houses at any time, and particularly during the present shortage of labor and material. It requires the fewest laborers, the shortest time for erection, less concrete per house, and, having hollow walls, produces a drier house than obtained by any other form of masonry construction. It is likewise adaptable to base hospitals, barracks, one-story factories, etc. In factory buildings, where no interior finish is required, the interior wall surfaces may be metal-lathed and concreted in the same manner as described for the exterior.

After the cellar has been excavated a stone or concrete foundation wall is built. In the latter case the concrete is poured from a traveling mixer, with loader, into wood forms made in panels so as to be easily removable. The first-floor wood joists are then set in place on the foundation wall. On these a wood frame, consisting of studs, joists and rafters, is erected in the usual manner of building the skeleton of a frame house. Every fourth stud is doubled, allowing the 3 by 4 inch space between, which is filled with concrete, to form a concrete stud. At the second floor and roof levels, a ledger board, with bottom attached, is placed over the studs and so arranged that, when filled with concrete, they form beams which, with the vertical concrete studs, make a homogeneous concrete frame. The concrete studs when completed are continuous from foundation to roof. On the top of the lower ledger board the second-floor joists are set, then the second-story studs, and so on. When this frame is completed, including the party wall, and the roof is on, heavy waterproof paper is nailed to the outside of the exterior wall studs, leaving the space between the double studs open to receive the concrete. Over the waterproof paper the metal lath, or concrete reinforcement, is stretched. The concrete studs are reinforced with steel rods fastened to the metal lath. The ledger boards have a bottom wood piece or form, so that when filled with con-

crete they act as beams to carry the floor joists and roof rafters. The wood studs act in the dual capacity of supporting the cement stucco while it is being applied and as furring strips in the finished building.

Everything is now ready to apply a 1½ to 2 inches thick concrete coating to the exterior by means of the cement gun, filling the space between the doubled studs to form the continuous vertical concrete stud. If, for any reason, the cement gun is not available, the continuous vertical studs and ledger boards can be poured with concrete and the exterior metal lath coated with 1:2 cement mortar by hand. The concrete is 33 per cent denser than ordinary poured concrete and about twice as strong. Color effects may be obtained by adding mortar stain to the concrete while it is being mixed. No further treatment of the exterior wall surface is needed. The rapidity with which this type of house may be erected is dependent only upon the number of cement guns put into simultaneous operation, or, if the work is done by hand the number of workmen employed at any one time. Particular attention is called to several of the chief points in favor of this construction, which are: First, after the framework of any number of houses is once erected, the cement can be applied without any interruption, in contradistinction to the usual procedure of stuccoing a part of the work, then shifting the laborers and their materials to another portion while the first is being completed, and then having to shift them back again. Second, the numerous cracks so common to all other forms of concrete construction are entirely eliminated in this process, because the vertical concrete studs carry all the load so that there is no shrinkage or settlement to contend with in this monolithic structure. Party walls merely have a skim coat of white plaster applied to the cement for a finish, which makes a saving on this wall alone of at least 8 cents per square foot over the usual plastered surface. Either of these two latter methods of construction compete very favorably with frame, especially now when wood is expensive and difficult to obtain.

The fundamental idea involved is to produce a cheap, semi-fireproof house, i. e., one which may be built with the same rapidity and cost as an all-wood structure. If it is desired to increase the fire-resisting qualities of the building, metal lath, instead of wood lath, may be used on interior surfaces which are to be plastered.

Proper attention and consideration should be given to lighting, heating, and ventilating equipment.

Interiors should be finished in light shades in order better to distribute natural illumination. Such shades as light buff for side walls and cream for ceilings are giving good results in many plant restaurants. The total glass area should be amply sufficient for admission of the proper amount of light. In no case should the total glass area of the windows be less than one-tenth of the floor area of the various rooms in which they occur. On the other hand, this area should not be exceedingly large, especially in cold climates, for economical reasons. Windows are a source of enormous heat losses and, therefore, should not be placed in a wall indiscriminately or indifferently. A large room is usually best lighted when the windows are built close up to the ceiling. Furthermore, the reflected light coming down from the light ceiling above is not hurtful to the eyes.

Steam or hot-water heating is generally to be preferred to any other system. The initial cost, however, is perhaps so great as to make its use prohibitive because of the fact that no artificial heat is required for four or five months of the year. Independent stoves will, no doubt, be resorted to in the more temporary structures. Adequate provision for the prevention and extinction of fires should, therefore, be made.

Cross ventilation through windows of the hinged type rather than the double-hung type is probably the most effective way of clearing the dining rooms and other rooms of foul air, body odors, etc. Mechanical ventilation by use of the force-draft or plenum-room system is the last word in ventilation, but again the element of cost prohibits its installation in all but the more permanent or comparatively permanent buildings. Refrigerators and storage

rooms should receive minute attention in the matter of ventilation, no matter what the class of building. In all the kitchens a hood of galvanized iron should be built over the ranges and connected to a separate flue for the purpose of carrying off steam, gases, odors, etc.

SUMMARY

In summing up this section on construction a few of the more important matters may properly be re-emphasized.

LOCATION

The buildings should be convenient to the workers, not too far distant from the work places. The kitchen should occupy a central position, and when mess halls are detached they can readily be served with food from a central kitchen. The location of all buildings should be such as to secure good natural lighting and ventilation.

RAILINGS AND COUNTERS

It is very important that railings or barriers be placed in front of self-service counters so that the men can be kept in an orderly line. The service counters should be of sufficient length and width to avoid crowding of food placed thereon. The counters should be so constructed as to furnish the maximum protection to the food while making it accessible to the workmen. Pastries, particularly, should be so guarded as to prevent their being handled indiscriminately by the workmen before final acceptance. It is not an uncommon practice for the men to lift pie crusts to inspect the filling before acceptance. Such practices, for sanitary, if for no other reasons, should be prevented.

The self-service counters should carry a front rail on which the trays can be slid along as they are being filled. An alternative where combination dinners are served is a movable belt or conveyor.

SPACE

For promptness of service, ample space is required in the entrance and exit passages, in the kitchen and in the dining or mess halls. The proper dining room space is from 8½ to 10 square feet per person seated. This is recommended both by the British Health of Munitions Workers' Committee and by the New Jersey Department of Labor.

TABLES AND SEATS

Tables and seats should be as attractive as possible, without being fancy. The tops of the tables should be of material easily cleaned. Hard maple, or soft wood covered with linoleum or other durable material, make serviceable tops. Composition glass or white tile table tops are also giving satisfaction. Seats may be of the stool, chair, or bench type. When space permits, the chair is preferable. The stool attached to the table as described on pages 16 and 17 is giving satisfaction in the works restaurant of the Illinois Steel Co.

WINDOWS

Windows should be so placed as to give the maximum of light with the minimum of heat loss. In narrow mess halls roof lighting is sometimes quite

satisfactory. The window should serve as a ventilator also wherever possible. The swinging type of window gives better ventilation possibilities than the vertical opening, where one-half the window space is necessarily occupied with the sash and glass.

SCREENS

These should be full length and sixteen mesh. The swinging windows, if swung inside, will not interfere with the full length window screen.

RESTAURANT EQUIPMENT

The proper equipment of kitchen, dining and mess rooms is next in importance to the selection of site and construction of the necessary buildings.

COOKING APPARATUS

English and American experience have demonstrated that "the efficiency of the cooking in a canteen depends to a large extent on the wise choice of the cooking apparatus." The kind of fuel to be used will depend to some extent upon geographical location and to some extent, also, upon the size of the canteen. Electricity is cleanest, but usually is too expensive. Gas, in most cases, will probably prove the most efficient cooking medium. In plants where steam is readily available it will be found excellent for cooking purposes and it is also the most desirable and economical medium for the warming of cold foods and keeping hot such foods as are served hot.

Hotel and restaurant equipment manufacturers and distributors will usually be able to submit the best plan and method of installation if they are furnished with particulars such as the number to be catered to, location of canteen, etc.

The following quotations from the hand-book prepared by the Health of Munition Workers' Committee, London, 1917, should prove of value:

The following particulars relating to cooking apparatus may be useful:

For 100 persons:

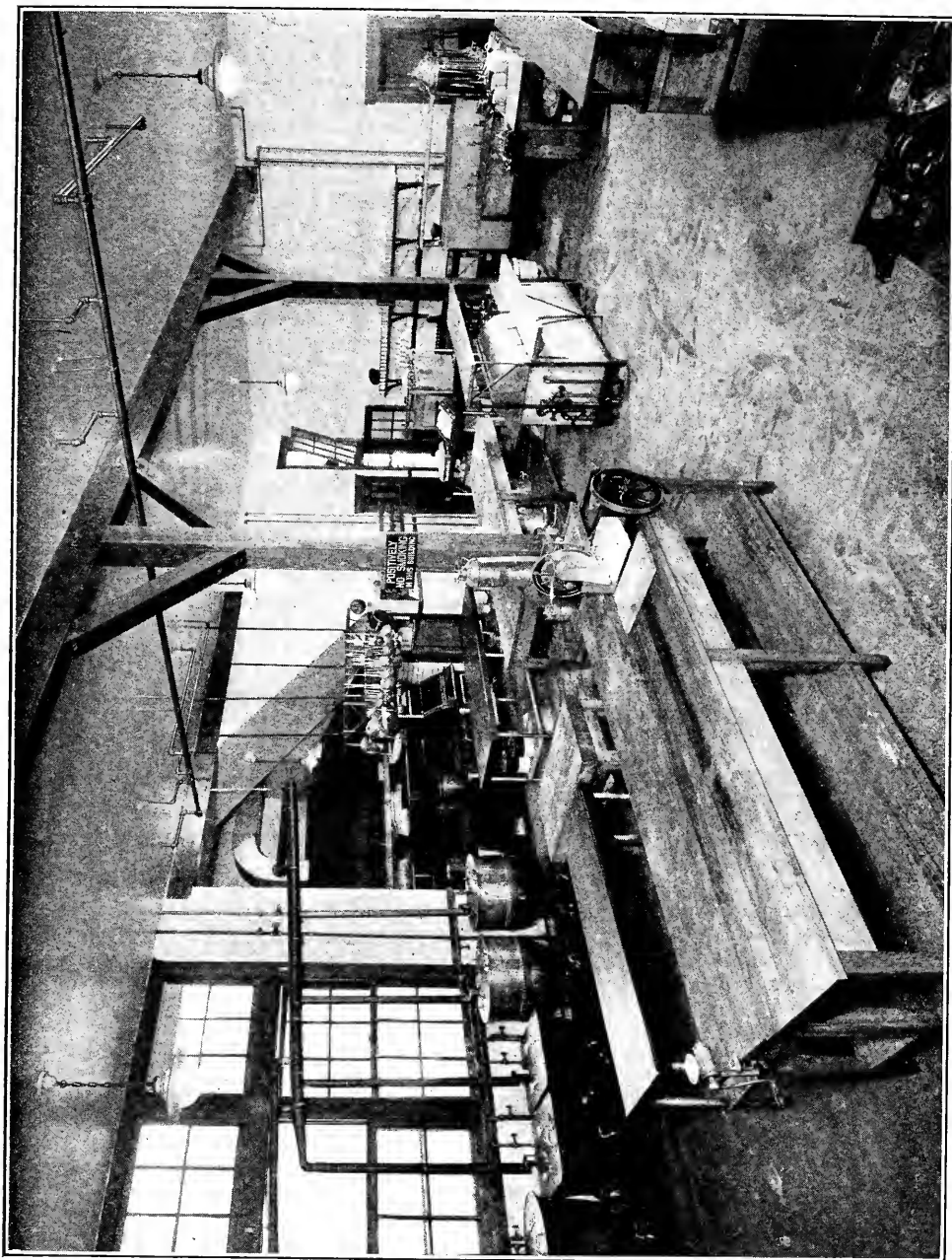
- One double-oven range for roasting and baking, with hot plate for boiling, frying, etc.
- One hot closet and warming cupboard, about 48 inches long by 30 inches high by 24 inches deep.
- One 15-gallon boiler for vegetables, etc.
- One 15-gallon boiler for tea water, washing up, etc.

For 250 persons:

- One 3-oven range for roasting and baking, with hot plate for boiling, frying, etc.
- One hot closet and warming cupboard, about 72 inches long by 30 inches high by 30 inches deep.
- One potato and pudding steamer.
- One 20-gallon boiler for vegetables.
- One 25-gallon boiler for tea water.
- One 10-gallon boiler for soup.
- Boiler for supplying hot water through the sink taps.

For 500 persons:

- One large roasting oven.
- One 3-oven range.
- Hot closets and warming cupboards to form part of each serving counter.
- Carving table with hot closet under for warming plates.
- One potato steamer.



KITCHEN OF SUBMARINE BOAT CORPORATION, NEWARK, N. J., MAY, 1918

One pudding steamer.

One 25-gallon boiler for vegetables.

Two 25-gallon boilers for tea water.

One 20-gallon boiler for soup.

Boiler for supplying hot water through the sink taps.

Teak sinks (3 feet long, 2 feet wide, 1 foot deep) are generally more suitable for washing up crockery, etc., than the ordinary sinks of glazed fire clay. The latter or sinks of galvanized iron can be used for vegetable preparation, etc. There will be a percentage of the users of the canteen, at the commencement, at any rate, who will require "warming-up" facilities. These can be provided for by warming closets or hot plates. It is always advisable to undertake to warm up meals. Before some workers will use the canteen they must come and see things for themselves. It is often found that after a while they compare the meal which they themselves bring with that purchased in the canteen, generally to the disadvantage of the carried meal.

CATERING EQUIPMENT

Experience has demonstrated that it is good economy, owing to the high cost of labor, to install apparatus and machinery sufficient to do the maximum of kitchen work consistent with the local conditions.¹ Among other labor-saving devices mention may be made of the potato peeler, potato masher, bread mixer, bread slicer, bread crumber, butter cutter, meat slicer, meat chopper, vegetable chopper, egg whip, flour sifter, lemon squeezer, silver cleaner and polisher, and dish-washing machines. As dish washing is one of the big problems in all catering the following quotation may prove useful to some prospective buyers of dish-washing machines:

HAND VS. POWER DISH-WASHING MACHINES

The principle on which any dish-washing machine, hand or power, must work is the passing over the surface of the dirty dishes of hot water and soapsuds not over 190 degrees of heat, and the subsequent rinsing and sterilizing of these dishes in clean water at 212 degrees of heat.

When a great number of dishes are to be washed, the weight of the dishes to be moved to and fro through the water and the quantity of water to be pumped over the dishes necessitates power, but, where a small quantity of dishes are to be washed, one basketful after another can be agitated in the water by hand by the attendant, who otherwise stands idle while power does the agitating.

For a quantity of dishes not exceeding 1,500 per hour, hand power produces the same results as mechanical power, and eliminates the cost of the motor, the pump, and the current to run it. For 2,000 dishes and upward per hour, power is advisable, and additional attendants are required to handle the work as the number of dishes increases.

The claims made that power is advisable for all dish-washing machines should, therefore, be qualified by stating for all dish washing calling for over 2,000 dishes per hour.

(The Modern Hospital, p. 71, Vol. IV, 1915.)

Tableware, to be economical, should be of a quality not easily breakable. It is important, however, that the dishes be attractive, and a good buyer can select ware that is both durable and attractive.

Experience teaches that it is good economy to purchase high-grade equipment even though the first cost may appear excessive. To illustrate, in one of the shipyard canteens the enamelware used in the mess halls proved of such poor quality that the coating came off in flakes. Unless such ware is high-grade the rough usage from mechanical washing and stacking is certain soon to make it quite useless. The Army and Navy specifications call for heavy vitrified china for canteen purposes.

¹ Many establishments, in addition to the attractive restaurants, have exceptionally well-equipped kitchens with all the up-to-date electric machines for saving work. An electric dish-washing machine through which 24,000 pieces could pass in an hour with practically no breakage and an electric potato peeler holding a barrel of potatoes at a time, are features of one establishment. In almost all of the restaurants which serve large numbers, part or all of the many electric labor-saving devices have been installed. "Lunch Rooms for Employees," by Alice L. Whitney, Monthly Review, U. S. Bureau of Labor Statistics, December, 1917, p. 211.

The following classified list of equipment, with notations, is from the admirable report of the British Health of Munition Workers' Committee:

- | | |
|--|--|
| <p>I. Catering office equipment:
 Account books, etc.
 Chairs.
 Desk.
 Safe for money.</p> <p>II. Mess room:
 American cloth or linoleum for tables and counter.¹
 Chairs or benches.²
 Cash till.
 Curtains for window (dark).
 Scraper mat at door.
 Tables (2 feet 3 inches or 2 feet 6 inches wide).³
 Waste-paper baskets.⁴</p> <p>III. Table equipment cutlery:
 Carving knives and forks.
 Dessert spoons (7 inches in length).
 Forks (7½ inches in length).⁵
 Knives (9½ inches in length).⁵
 Mustard spoons.
 Steels.
 Salt spoons.
 Tablespoons (8½ inches in length).
 Teaspoons (5¼ inches in length).</p> <p>IV. Glass crockery:
 Cups (liquid capacity 10 ounces) and saucers.
 Egg cups.
 Jugs for water (liquid capacity 2 pints).
 Mustards.
 Milk jugs (liquid capacity 1½ pints).
 Meat dishes (assorted sizes).
 Peppers.
 Plates for meats and puddings (10½ inches, one size only).⁶
 Salts.⁷
 Small plates (7½ inches).
 Sugar basins.
 Soup bowls (preferable to plates).
 Teapots.⁸
 Tumblers (liquid capacity 13 ounces).
 Vinegars.</p> <p>V. Cooking and serving apparatus:⁹
 Boilers or steamers for vegetables and puddings.
 Boilers for heating water for making tea, etc.
 Carving table.
 Hot-water apparatus for washing up, etc.
 Oven range.</p> | <p>V. Cooking and serving apparatus—Continued.
 Roasting oven.
 Hot closet for storing cut-up plates or meat, etc.
 Stock pot.
 Grilling table.</p> <p>VI. Linen:
 Dusters.
 Glass cloths.
 Kitchen rubbers.
 Muslin strainers.
 Swabs.
 Small hand towels.</p> <p>VII. Kitchen, scullery, and larder requisites, etc.
 Baking tins.
 Bass broom.
 Box of mixed tools and accessories.
 Bread knife.
 Bread-cutting machine.
 Cooks' knives.
 Colanders.
 Chopping board.
 Covered sanitary bins.
 Corkscrews.
 Dust pan and brushes.
 Enameled washing-up bowls.
 Enameled cans.
 Enameled pie dishes.
 Frying pans.
 Flour dredger.
 Flour bin.
 Fish kettle.
 Gravy strainer and ladle.
 Graters.
 Japanned trays.
 Knife machine.
 Knife boxes.
 Kitchen chairs.
 Kettles.
 Large black oval pots with tin covers.
 Large iron spoons.
 Lemon squeezers.
 Meat safe.
 Meat chopper.
 Mincing machine.
 Potato-peeling machine.
 Plate rack.
 pudding basins.
 Pastry board and rolling pin.
 Rigid table.</p> |
|--|--|

¹ In some of the best managed canteens the use of tablecloths has been found quite satisfactory.

² Chairs are generally found to be more comfortable and satisfactory than forms, particularly where the workers wait upon themselves.

³ If space permits, frequent passages between the tables should be allowed for.

⁴ Waste-paper baskets, preferably wire ones, should be provided about the mess room; the effect these have on the general tidiness of the room is considerable. Trucks can be used for the collection of dirty crockery, etc.

⁵ Large knives and forks only are necessary; the most suitable knives are those with solid metal handles.

⁶ The provision of flat-topped covers for the plates of food is suggested, as these keep the food hot and render them more easily stored in the hot closets.

⁷ Pourer salts can be used, but it is generally found that an ordinary salt and spoon is best.

⁸ It is not generally advisable to supply a teapot for each individual, and only cups of tea should be served. The tea can be made in gallon teapots, but can be most economically served from an urn.

⁹ In some districts the local gas companies will hire out stoves, etc., for cooking.

- VII. Kitchen, scullery, and larder requisites, etc.—Continued.
 Scales and weights.¹
 Scoop.
 Sweeping brushes.
 Scrubbing brushes.
 Saucepans.
 Stepladder.
 Sinks (a good size 3 by 2 by 1 foot).²
 Sink brushes.
- VII. Kitchen, scullery, and larder requisites, etc.—Continued.
 Sink baskets.
 Tin opener.
 Towel rack.
 Tea canister.
 Urns holding capacity 4 to 6 gallons).³
 Wire dish covers.
 Wire sieves.
 Wooden spoons.

The kitchen of an exceptionally well-equipped industrial canteen for 280 persons at Leeds (England) contains the following utensils: One large gas stove (three ovens); one steam-heated hot closet and carving table for heating plates and dishes and keeping the food hot; one steamer with four compartments for steaming and boiling; one 30-gallon steam-jacketed pan for soups; one 10-gallon copper water-jacketed pan for milk, stewed fruit, porridge, etc.; a knife machine; a potato peeler; a bread cutter; a steam kettle; a whisking machine for batter and Yorkshire pudding; a mincing machine; large bins for storage; enamel bowls, jugs and stew jars, substantial tinned steel bowls for baking, and ordinary kitchen and dining-room "crockery" of white stone-ware. This canteen has a staff of matron, cook, and four assistants.

In one of the large American shipyards the following equipment is designed for use in 9 separate mess halls, in each of which an average of 1,000 men will be fed per day:

- | | |
|-----------------------------|---|
| One refrigerator. | Six hundred pie plates. |
| One 9-foot steam table. | Six hundred knives. |
| Two coffee urns. | Six hundred forks. |
| Two hot-water urns. | Six hundred tea spoons. |
| Three hundred trays. | Six hundred soup spoons. |
| Six hundred soup bowls. | One modern steam dish washing and drying apparatus. |
| Six hundred dinner plates. | |
| Five hundred water glasses. | |

These mess halls are to be served from a central kitchen. Two larger mess halls in the same plant, each designed to accommodate 3,000 men per day, will each require three times the permanent apparatus specified above and four times the amount of crockery and other tableware.

The following kitchen and dining room equipment is in use in the cafeteria of the Bureau of Engraving and Printing, Washington, D. C., where some 8,000 meals or portions of meals are dispensed every workday, 4,000 being dispensed between 11.30 a. m. and 1 p. m.:

- | | |
|---|--|
| One hundred dozen 7-inch plates. | Twenty-four roasting pans, 16 by 20 inch. |
| One hundred dozen 4-inch plates. | Forty-eight basting spoons. |
| One hundred dozen 4-inch baker, vegetable tables. | Seventy-two granite-ware pans, 18 by 22 inch. |
| One hundred dozen mugs. | Twenty-four granite-ware bread trays, 18 by 24 inch. |
| Two thousand knives. | Three large soup ladles. |
| Two thousand forks. | Sixty-four dozen glasses for milk. |
| Two thousand five hundred teaspoons. | One large potato peeler. |
| Two thousand table or dessert spoons. | One bread mixer. |
| One thousand five hundred ice cream saucers. | One bread slicer. |
| Fifty dozen salt casters. | One bread crumber. |
| Fifty dozen pepper casters. | Six coffee and tea urns. |
| Fifty dozen cruets. | Two milk containers. |
| Two thousand five hundred butter chips. | Two large copper pots, 100 gallons. |
| Two hundred custard cups. | Two small copper pots, 40 gallons. |
| Two thousand five hundred steel trays, tinned. | Six vegetable boilers. |
| Twenty-four roasting pans, 18 by 24 inch. | One large broiler. |
| | Four dish trucks. |

¹When large quantities of food have to be purchased, a platform scales is suggested as well as a small cook's scales. It is most important that everything should be weighed and checked.

²There should always be at least two sinks provided, one for the cook's own use, and the other for the general washing up.

³Urns with earthenware linings are recommended, as the ordinary unlined urns show a tendency after a time to impart an unpleasant taste to the tea.

[Appendix to Memorandum No. 3 (Industrial Canteens) Health of Munition Workers' Committee, London, 1916, pp. 6-7.]

Sixteen dish trucks, trays, wood.
 One butter cutter.
 One meat slicer.
 Two large steam tables.
 One polisher for silver.
 Two large vegetable choppers.
 Four kitchen tables (wood).
 Four egg whips.
 Two large carving knives.
 One large platform scale.
 One counter scale.

Twenty-four granite pans, 16 by 22 inch
 (for pudding).
 Two silver baskets (to wash silver with).
 Twelve garbage cans.
 One flour sifter.
 One potato masher.
 One large dish washer.
 One ice box for cheese.
 One ice box for butter.
 One ice box for cooked meats and salads.
 One ice box for milk.

COST OF EQUIPMENT

It is impossible to do more than present a few general statements as to cost of kitchen and catering equipment. In any large cafeteria or restaurant labor-saving machinery and apparatus will be found economical, quite regardless of original cost, provided that only high-grade articles are purchased.

In the British Health of Munition Workers' Committee reports some estimates of equipment costs are given, but they are hardly applicable to this country. Prices, too, here, as elsewhere, are continually changing. The most practical way to learn the cost of equipment is first to determine upon the number of employees to be fed and then solicit plans and bids from reliable firms which make a specialty of manufacturing and handling hotel equipment.

In this connection the following quotation from a recent article will be of interest:

A lunch room for which construction and equipment costs were given was built to seat 1100 people at one time. The room has a very large cafeteria counter and small tables with Carrara glass tops. The cost of the special construction of the dining-room and kitchen was about \$5,300, while the equipment, furniture, and fixtures cost approximately \$6,200. About 2,500 employees use this lunch room daily. ("Lunch Rooms for Employees," by Anice L. Whitney, Monthly Review, U. S. Bureau of Labor Statistics, December, 1917, pp. 210-211.)

That many American industrial concerns have well-equipped restaurants and cafeterias is evident from the following quotations, which might easily be extended.

The Remington Arms Union Metallic Cartridge Co. (Inc.), Bridgeport, Conn.:

There are two restaurants provided for those living too far away from the works to enable them to go home to lunch. One is centrally located in the plant, which accommodates about 850 twice each day, for lunch. The other is directly across the street from the works and is located in the barracks. This will accommodate several hundred, and is open for business all the time, making it possible for anyone to get all their meals there if they so desire. The food is clean and pure and is prepared in kitchens that are remarkable for their cleanliness and up-to-dateness. (The National Association of Corporation Schools Bulletin, December, 1917, p. 17.)

The General Electric Co., Schenectady, N. Y.:

It is the endeavor of the company that food shall be of the best quality, portions large, and service prompt. Fresh vegetables supplied from the company's farm are served during the summer months. The restaurant is provided with all necessary cooking and refrigerating equipment, and all food is prepared in the building. In addition to the table d'hôte dinners, which are served only during the noon hour, à la carte service is maintained during the remainder of the day. While the table d'hôte meals cost something more than the price charged for them, this loss is about offset by the profit in the à la carte service and the sale of tobacco and cigars. The restaurant as a whole is consequently about self-supporting. (The National Association of Corporation Schools Bulletin, December, 1917, pp. 11-12.)

The Kohler Industries, New York City:

An airy and cheerfully decorated restaurant is maintained adjacent to the various factories for the convenience of the employees. Clean, wholesome food in generous portions is served here at exceedingly moderate prices. The equipment is ample and modern in every way, and the appliances in the culinary department rival those of many well-known hotels. A competent manager is

in charge, and everything possible is done to make the restaurant a comfortable meeting place. There is a main dining room with a capacity of 400. Employees are served here from 12 to 2. (The National Association of Corporation Schools Bulletin, December, 1917, p. 15.)

The Curtis Publishing Co., Philadelphia, Pa.:

The kitchen and dining room apparatus of this company represents a distinct style of equipment, designed to harmonize with the finish of the rooms and to feed the employees at the most economical cost of service and preparation of food products. The gas range installed in the kitchen does away with the handling of coal and ashes, and the steam cooking kettles eliminate the cost of fuel. The section of the hood over the kettles is lined with copper and the condensing steam, which drips back into the pan holding the kettles, runs off through the gutters and outlets provided for it. The kitchen refrigerators are lined inside with white enamel, and there is also a refrigerator for freezing the garbage, to prevent escaping odors in removing it from the building. (The National Association of Corporations Schools Bulletin, December, 1917, pp. 13, 14.)

Several of the American shipbuilding companies also, as has previously been indicated, have installed up-to-date equipment in their restaurants, cafeterias, and lunch-rooms. Notable among these are the equipments installed at the three fabricated yards—Submarine Boat Corporation, Newark, N. J.; American International Shipbuilding Corporation, Hog Island, Philadelphia, Pa.; and the Merchant Shipbuilding Corporation, Harriman, Pa.

SOME REPRESENTATIVE MAKERS OF AND DEALERS IN HOTEL, RESTAURANT, AND CAFETERIA EQUIPMENT

The names and addresses of several of the leading houses selling restaurant and hotel equipment are presented in the following list. No pretense is made that this list is complete, but it is fairly representative, geographically, and it should prove helpful to prospective buyers of kitchen ranges, kitchen machinery and apparatus and other restaurant equipment:

Morandi-Proctor Co., Boston, Mass.
 Bramhall Deane Co., New York, N. Y.
 L. Barth & Son, New York, N. Y.
 New York French Range Co., New York, N. Y.
 Duparquet, Huot & Moneuse Co., New York, Chicago, Boston, Washington.
 G. S. Blakeslee & Co., New York and Chicago.
 Russell & Watson, Buffalo, N. Y.
 V. Clad & Sons, Philadelphia, Pa.
 Wm. F. Dougherty & Sons, Philadelphia, Pa.
 Victor V. Clad & Co., Philadelphia, Pa.
 Bernard Gloekler Co., Pittsburgh, Pa.
 Demmler & Schenck Co., Pittsburgh, Pa.
 Hutchinson Bros., Baltimore, Md.
 Maag-Ostendorf Co., Baltimore, Md.
 S. B. Sexton Stove & Manufacturing Co., Baltimore, Md.
 E. B. Adams Co., Washington, D. C.
 Dulin & Martin Co., Washington, D. C.
 C. Elmo Billups, Norfolk, Va.
 Gilreath Durham Co., Greenville, S. C.
 Hotel Equipment Co., Atlanta, Ga.
 Tampa Hardware Co., Tampa, Fla.
 Empire Scale & Fixtures Co., Jacksonville, Fla.
 A. Baldwin & Co., New Orleans, La.
 Wrought Iron Range Co., St. Louis, Boston, Denver.
 Lincoln Fixture & Supply Co., Lincoln, Nebr.
 Omaha Hotel Supply Co., Omaha, Nebr.
 Salt Lake Hardware Co., Salt Lake City, Utah.
 Cass-Smurr-Damerel Co., Los Angeles, Cal.
 Chas. Brown & Sons, San Francisco, Cal.
 Newton-Weller-Wagner Co., San Antonio, Tex.
 Burton Range Co., Cincinnati, Ohio.
 John Van Range Co., Cincinnati, Ohio.

Wm. Miller Range & Furnace Co., Cincinnati, Ohio.
 May-Fieberger Co., Akron, Ohio.
 Star Hardware & Supply Co., Toledo, Ohio.
 Schwenger-Klein Co., Cleveland, Ohio.
 Born Steel Range Co., Cleveland, Ohio.
 Shoedinger-Marr Co., Columbus, Ohio.
 Chicago Hardware Foundry Co., North Chicago, Ill.
 Vonnegut Hardware Co., Indianapolis, Ind.
 Chicago Range Co., Chicago, Ill.
 Crown Wells Co., Chicago, Ill.
 William F. Traub, Chicago, Ill.
 Albert Pick & Co., Chicago, Ill.
 Detroit City Gas Co., Detroit, Mich.
 H. C. Weber & Co., Detroit, Mich.
 Keifer-Haessler Hardware Co., Milwaukee, Wis.
 E. W. Morgenthaler & Son, Milwaukee, Wis.
 Marshall-Wells Hardware Co., Duluth and Winnipeg.
 Joesting & Schilling Co., St. Paul, Minn.
 Chase & West, Des Moines, Iowa.
 The Orcutt Co., Sioux City, Iowa.
 Zahner Manufacturing Co., Kansas City, Mo.
 Dohrmann Commercial Co., San Francisco, Cal.
 The Ingle Manufacturing Co., San Diego, Cal.
 Anglo Range & Refrigerator Co., Los Angeles, Cal.
 Honeyman Hardware Co., Portland, Ore.
 B. B. Buell & Co., Seattle, Wash.
 Gurney Foundry Co., Vancouver, B. C.
 MacLennen, MacFeeley (Ltd.), Vancouver, B. C.

SANITATION AND HYGIENE

LOCATION, LIGHTING, AND VENTILATION

The buildings should be located conveniently in or near the shipyards, and there should be an abundance of natural light in the dining rooms and kitchen from windows or skylights. Well-lighted and ventilated buildings adequately equipped with necessary facilities and strict cleanliness of operations are of great importance in maintaining sanitary conditions in restaurants and eating houses.

The kitchen should be given a central location, if possible, so that food may be served readily to wings on either side or to adjacent mess halls. Non-absorbent floors of concrete or composition are most easily kept clean.

HEALTH OF EMPLOYEES

Probably the greatest factor in the spread of disease from restaurants and eating houses is the employee who is suffering from a communicable disease or who is a carrier of infection. For this reason the industrial physician should make an inspection of each employee before he commences work and all employees affected with any venereal disease, smallpox, diphtheria, scarlet fever, yellow fever, tuberculosis, trachoma, typhoid fever, dysentery, measles, mumps, whooping cough, chicken pox, or any other infectious or contagious disease, should be excluded from the eating places, nor should they be allowed to handle any food.

WATER SUPPLY

The water supply should be obtained from a source which is known to be safe. Many of the city supplies are now properly safeguarded, but inquiry should be made as to whether the supply is approved by the State Board of Health. Water taken from streams and rivers is generally dangerous, unless purified. Shallow wells with inadequate protection at the surface to exclude pollution also favor the spread of water-borne diseases. A sanitary inspection of the surroundings as well as a chemical and bacteriological examination of the water from such wells should be made before it is used.

In certain instances difficulty has been experienced in making good coffee. This is often due to lack of cleanliness in utensils and to iron in the water. The coffee container should be cleaned and scoured daily. Iron in the water sometimes produces a muddy and uninviting liquid due to the formation of tannate of iron. This trouble can often be obviated by using water from another source or by aerating and filtering the water.

QUALITY OF FOOD

Great care must be taken to serve only wholesome food, as many cases of dysentery and other intestinal disturbances have been traced to spoiled food. If there is any doubt about the condition of meats or other foods, they should not be served. Inspected meats should be purchased if they can be obtained. The Government annually spends several millions of dollars to inspect meats, but unfortunately all meat sold is not so inspected. Meat from local slaughterers who do business entirely within the State is not subject to Federal inspection.

PASTEURIZATION OF MILK

Proper protection from tuberculous infection demands that the milk supply should be pasteurized or be obtained from cows which have been tuberculin tested within a year by a reliable veterinarian. Tuberculosis has been shown to

be transmissible to man through milk infected with bovine tuberculosis and septic sore throat and diphtheria have also been traced to infected milk supplies. Thorough pasteurization protects the consumer from such infection. Butter in many instances has been found to contain living tubercle germs, and for this reason the milk and cream used in its manufacture should also be pasteurized.

REFRIGERATION OF FOOD

Adequate provision for refrigerating meats, milk, butter, and other foods is essential. For this purpose, ice boxes provided with a sanitary lining, preferably of enameled metal or porcelain, and so located that the ice may be inserted without being carried through the kitchen, are desirable. These ice boxes should be thoroughly cleaned daily and a frequent inspection made to ascertain the condition of the food in them. It is quite necessary and desirable that meats, dairy products, and vegetables be kept in separate compartments, both to prevent the tainting of milk and butter and as an aid to orderliness, cleanliness, and sanitation generally.

STOREROOMS

The rooms in which the groceries and other provisions are stored should be dry, tightly screened, well ventilated, and protected from vermin. There should be a sufficient number of shelves so that all of the stock can be stored in an orderly manner. All food should be securely protected from dust and dirt and no one should be permitted to live or sleep in a kitchen or dining room or other room of an eating place where food is prepared, served, or stored.

PROTECTION AGAINST THE FLY

All food should be carefully protected from flies. Doors, windows, and other openings should be screened during the fly season with wire of not less than 16 meshes to the inch. Screen doors should be self-closing and all screening should be maintained in good condition. When conditions are such that the entrance door remains open as the men enter, a vestibule should be provided in which a fan should be operated at such times to produce an outward draft. Flytraps properly baited should be placed where flies congregate. Full information regarding the construction of such traps and the best baits to use in them are contained in Bulletin 734 of the Department of Agriculture, which will be furnished free upon request to that department.

DISH WASHING

Cleanliness demands that there should be abundance of running hot and cold water for dish washing and general cleaning purposes.¹ Mechanical dish-washing machines have the advantage of reducing labor cost and permit a more sanitary handling of dishes, but if such equipment is not installed, hand washing of dishes may be satisfactorily accomplished if proper facilities are provided. These should include sinks having proper provision for rinsing and drying the dishes.

LAVATORIES AND WASH ROOMS

Lavatories supplied with soap and individual towels should be provided in connection with all restaurants and maintained in a sanitary condition, and all employees and others who handle or prepare food should be required to wash

¹ The maintenance of cleanliness is one of the most important points in the whole scheme of a canteen, and it is one that the workers are quick to appreciate. In the mess room all floors, tables, seats, and windows should be thoroughly cleansed every day, and in the kitchen all cooking apparatus should be well scoured and kept scrupulously clean. The table equipment should always be well washed and polished. The immediate surroundings of the canteen should be kept free from rubbish and refuse, as by this means trouble from flies is greatly reduced. (Feeding the Munition Worker, p. 12, London, 1916).

their hands and arms thoroughly before commencing work and after visiting the toilet. Convenient and adequate toilet rooms should also be provided. These rooms should be separate and apart from rooms where food is prepared or served. The floors should be of non-absorbent material and should be kept clean and in a sanitary condition. Toilets and sinks should be properly connected to sewer through trapped and ventilated plumbing fixtures. Cuspidors for use of employees and other persons should be placed wherever necessary and thoroughly emptied and washed daily with a disinfecting solution.

COLLECTION AND DISPOSAL OF GARBAGE AND SEWAGE

Garbage, refuse, and waste products subject to decomposition and fermentation should be kept in covered impervious receptacles. Arrangements should be made with a reliable person or company to remove the garbage daily. If garbage be disposed of by feeding it to hogs, it is essential that the pens shall not be in proximity to the restaurant and that they be maintained in a sanitary condition to prevent fly-breeding and nuisance. The sewage should be disposed of in a sanitary manner and not be permitted to discharge upon the surface of the ground or into adjoining open ditches. The Health and Sanitation Section of the Emergency Fleet Corporation will furnish advice and assistance regarding suitable methods for the disposal of sewage. A properly designed, constructed and operated grease trap on the main drain from the kitchen sink will make possible the recovery of considerable grease which, under present conditions, is valuable.

INSPECTION AND SCORE CARD

Sanitary and hygienic excellence should be insisted upon in all commissary buildings, equipment, foods, and food handlers. This cannot be too strongly emphasized. To attain this result, daily, thorough-going inspections by a well-qualified and responsible inspector are essential. The restaurant score card is an excellent method for checking and recording the sanitary and hygienic conditions of the commissary. The following card is in use by the Department of Health of Newark, N. J., and is also used, with slight modifications, by the commissary department of one of the large shipbuilding companies:

INSPECTION OF RESTAURANTS AND LUNCH ROOMS WHERE FOODS ARE PREPARED OR SOLD

Owner or lessee

Address

Trade name

Location

Date of inspection Inspector

EQUIPMENT AND CONSTRUCTION	Score		Cleanliness and Methods	Score	
	Perfect	Allowed		Perfect	Allowed
Dining room:	7		Employees:	16	
Floors smooth, tight, clean- able 0.5			Apparently healthy 2		
Allow only ¼ point for wood floor. .... .5			Certificate of recent medical examination 7		
Walls smooth, tight, cleanable Ceilings smooth, tight, clean- able ..... .5			Cleanliness, garments, 1; where outer washable garments are used, 2 3		
Light—Natural, ¾; artificial, ¼ 1			Cleanliness of hands, 2; when rubber gloves are used in handling food 4		
Ventilation — Windows, ½; local ventilation with fan, 1; flue system, 1½ 1.5			Dining room:	4	
Tables, ½; counter, ½; 1.5			Floors clean ..... .5		
Shelves, ½ 1.5			Walls clean and painted ..... .5		
Sanitary water cooler 1			Ceilings clean and painted ..... .5		
Screens ..... .5			Windows clean ..... .5		
Kitchen:	9		Linen, clean, ½; food cases, ½; water glasses, ½; cooler, ½ 2		
Floors smooth, tight, clean- able ..... .5			Kitchen:	9	
Allow only ¼ point for wood floors. .... .5			Floors clean 1		
Walls smooth, tight, cleanable Ceilings smooth, tight, clean- able ..... .1			Walls clean and painted 1		
Light—Natural, ¾; artificial, ¼ 1			Ceilings clean and painted 1.5		
Ventilation — Windows, ½; local ventilation with fan, 1; flue system, 1½ 1.5			Windows clean 1		
Tables, 1; shelves, 1; drain board, 1 3			Shelves, 1; tables, 1; racks, ½ 2.5		
Absence of crevices or ledges Screens ..... .5			Sinks, 1; drain boards, 1 2		
Apparatus and utensils:	4		Refrigerator—Clean, 2; if foods are in order, sepa- rate compartments for meats and foods 3	12	
Refrigerator—Size, 1½; ar- rangement, 1; good re- pair, 1 3.5			Garbage receptacles (top cov- ered and outside can) 1		
Proper drainage ..... .5			Freedom from flies and in- sects 5		
Washing facilities:	9		Cellar clean, ½; yard clean, ½ 1		
Running hot and cold water 2			Towels (dish and hand) 2		
Tables covered with metal, 1; or hardwood, one piece, good repair, ½ 1.5			Toilet compartment 2		
Drain boards covered with metal, good repair 1			Eating and cooking utensils:	10	
Wash basin, soap, towel (kitchen) 1.5			Thoroughly washed 2		
Dish-washing equipment, 2; if washed by hand and sterilized, 3 3			Scalded with boiling water or sterilized after washing. 6		
Toilet facilities:	6		Protected from contamination 2		
Location for patrons, 1; for employees, 1 2			Food:	14	
Good repair 1			Condition 5		
Wash basin, soap, and towel 2			Protected from contamination 3		
Screens and self-closing doors 1			Proper handling 2		
			Milk properly protected 1		
			Storage food 1		
Total.....	35		Total.....	65	

Equipment and construction.....Cleanliness and methods.....Total score.....

NOTE—If any exceptionally filthy condition is found, the total score will be zero.

MENUS: THEIR IMPORTANCE AND SOME TYPICAL EXAMPLES FROM SUCCESSFUL RESTAURANTS AND CAFETERIAS IN AMERICAN INDUSTRIAL PLANTS

FOOD ESSENTIALS

The following quotation states with precision and brevity some of the more essential factors to be considered in the preparation of menus for men, such as shipyard employees, engaged in hard, physical labor:

The amount of physical force expended in daily work and the environment of the work have a great effect on the requirements of the body for food. Hard labor and exposure to open air together call for increased food supply; sedentary work in an artificially heated and confined atmosphere, on the other hand, reduces the output of energy and less food is required. An ordinary laborer may lose one-sixth or more of his total energy output as work, and the remainder as body heat. A sedentary worker may lose little energy as work, and almost all as body. The loss due to this latter cause, as activity increases, grows out of proportion to the actual energy expended as work.

Natural foods yield the essentials required to replace the energy expended and for the repair and growth of the body. They contain these essentials in the form of protein, fat, and carbohydrates, and also supply salts and certain substances of unknown nature, called vitamins, which exist in minute quantities in fresh foods and are necessary for the growth and health of the body. Protein is the chief solid constituent of lean meat; it is also present in milk, cheese, and eggs; and occurs in all vegetables, particularly in flour (bread), peas, and beans; it is not only a source of energy, but it is also a body builder, and no dietary can be complete without it. Fat is chiefly derived from animals; nuts also are rich in fat (from which margarine is made), but other vegetables only contain fat in a much smaller degree. Carbohydrates are mainly derived from vegetables in the form of flour, potatoes, or sugar.

Fat and carbohydrates can replace one another in a diet, but the body digests and deals best with a certain proportion of each. Fat, however, yields weight for weight more than twice as much as energy as carbohydrate, and so in cold climates and cold weather more fat is naturally eaten. Experience shows that the diet should include raw food, fruit, or salads. The consumption of fresh fruit, such as apples, oranges, or bananas, is highly to be commended, and should be actively encouraged by the provision of good fruit at the lowest possible prices.

Fortunately the cheaper foods (bread, margarine, porridge, milk, herrings, cheese, beans, onions, cabbages, oranges, and the cheapest cuts of meat) provide all the requisite nourishments, and probably better health, than is derived from more highly flavored and expensive foods which only artificially stimulate the appetite.

(A Second Appendix to Memorandum No. 3 (Industrial Canteens) Health of Munition Workers' Committee pp. 3-4. By Leonard E. Hill, M. B., F. R. S., a member of the committee. London, 1916.)

ENERGY-PRODUCING QUALITIES OF FOOD

Careful consideration should be given to the energy-producing qualities of foods entering into menus. On this point the following statement may be quoted:

Investigations made by a number of authorities indicate that about 15 per cent of the energy expended is derived from protein, and about 80 per cent from fats and carbohydrates combined; that is to say, that normally protein supplies only one-fifth of the total energy expended. Numerous investigations have shown that the energy required by a man engaged in fairly light munition work is about 3,500 calories of food as purchased. Where calculations are based (as they are in this report) on food as eaten, the minimum canteen diet may be taken to be about 3,000 calories when balanced among the three classes of foodstuffs in the following proportions of dried weights: Protein, 100 grams; fat, 100 grams; carbohydrate, 400 grams. This diet will often be supplemented with fruit or other small addition, according to the individual taste. Men engaged in hard physical work, especially in the open air, require a good deal more energy-producing food, and may consume as much as 4,500 calories with advantage. (A Second Appendix to Memorandum No. 3 (Industrial Canteens) Health of Munition Workers' Committee, p. 4. By Leonard E. Hill, M. B., F. R. S., a member of the committee. London, 1916.)

FOOD SHOULD BE FRESH AND APPETIZING

The constituent parts of a dietary are important if the highest value is to be obtained, but, speaking generally, fresh digestible and appetizing food is more important than chemical composition or proportion. It will be understood that digestibility is dependent partly upon the food itself being of a nature which is easily digested and partly upon the organs of digestion being healthy and in good working order. Further, it should be noted that a variety of factors affect the relative value of food to the individual consuming it. For instance, there is the nature of the

employment, whether sedentary or active, and the amount of energy called for. With increase of work there must be proportionate increase in quantity and in nutritive value of the food eaten. Ill-paid laborers and others whose food amounts only to a bare minimum can neither put forth the same energy nor work at the same speed as a well-nourished man. The man who has to work hard, long, or rapidly needs a proportionately ample food supply, composed of highly nutritive ingredients to withstand the strain. (Health of Munition Workers' Committee Report on Industrial Canteens, p. 3, London, 1915.)

NEED OF GOOD QUALITY AND VARIETY IN DIETARIES

In England early in the war it was recognized that the industrial canteen would prove a valuable aid in bringing about better balanced rations for workers in munition plants. The following statement was made in a special report on the subject in 1915:

Though there is little doubt that workers are getting a better type of food than formerly, it must be admitted that large numbers of workers of both sexes are not getting such a dietary day by day. Much evidence is forthcoming that this is being increasingly recognized both by employers and workers. The difficulties in the way of adequate feeding arise mainly where the worker must have his meals away from home. In past years and even now in normal times the worker lived fairly close to his work and was frequently able to return home for his meal. At present the difficulties of securing adequate food are increased, owing to the prevalence of night labor and the large number of men and women who have to travel a considerable distance to their work.

In such cases the simplest alternative is for the worker to bring or receive from his home or lodgings food ready prepared for eating. The objection to this arrangement is the limitation in the kinds of food suitable and that it is necessarily cold and liable to be stale. There is a special danger of its being confined to what can be most quickly prepared the night before without much regard to its nourishing character. When the weather is warm or the food is kept for any length of time in a hot work-shop it readily undergoes degeneration. (Health of Munition Workers' Committee Report on Industrial Canteens, p. 4, London, 1915.)

It is highly important that rations be properly balanced and varied not only from meal to meal, but from day to day and from week to week.¹ If possible, the dietary should be varied so that the particular meals of a given day of the week shall not be practically identical from week to week. The psychology of too much repetition waits badly upon digestion and is as unnecessary as it is undesirable.

Many companies have become so thoroughly convinced that properly balanced rations are essential to the good health of their employees that special emphasis is placed upon this feature of their restaurant facilities.

The General Electric Co. of Cleveland, Ohio, has prepared an excellent booklet containing tested recipes for various soups and other articles of food entering into a well-balanced luncheon.²

Attention may also be called to a little book entitled "One Hundred-Portion War Time Recipes." These recipes are particularly valuable, as they have been thoroughly tested and can readily be adapted to any number of portions.³

The National Cash Register Co. of Dayton, Ohio, has given special attention to the proper feeding of its employees. The company has gone so far as to provide special tables for vegetarians. A dietitian is employed whose duty it is to see that the meals are well-balanced. (The National Association of Corporation Schools Bulletin, December, 1917, p. 13.)

For all shipyard workers the cold-dinner pail is an unsatisfactory solution of the lunch problem. It is essential that the almost universal deficiencies of the breakfast be made up by a simple yet wholesome diet, and above all by a diet that carries a stimulus of heat. As an alternative to the cold-dinner pail the saloon offers an attraction equally injurious to employee and employer; and the itinerant lunch vendor who haunts the outskirts of the shipyard at the noon hour offers no adequate return for the 10 or 15 cents customarily invested in his wares. Moreover, the financial

¹ We believe that the chief reasons for the success of the lunch room are that we aim to see that properly balanced rations are served promptly and cleanly. This appeals to the men, and the low-price schedule insures their attendance with the resulting benefits. (Extract from Illinois Steel Co's. letter of April 2, 1918.)

² The Preparation of Food for Factory Employees. The General Electric Co., Cleveland, Ohio, 1915.

³ One Hundred-Portion War Time Recipes, by Bertha E. Nettleton, Lippincott & Company, Philadelphia, Pa., 1918.

depreciation of the saloon industry has either eliminated the free lunch or reduced its quality to a marked degree, and the percentage of those who are able to eat in their own homes is almost negligible, except in a few unusually situated plants.

The worker who has come to his job after a breakfast furnishing but little food values, and who must rely upon a luncheon offering ordinarily an even lower ratio of nutriment, is incapable of giving full value to his employer, and in those departments where the wage is high, and theoretically the living conditions should be the best, the evening meal (in the majority of cases) yields more benefit to the delicatessen shop and bakery proprietors than to the man himself.

To those who have made a study of physical efficiency the relation of the question of under-nourishment to the stability of the working force and to its productive value seems of paramount importance. The psychological effect also upon the contentment of the working force is a factor not to be overlooked.

(The Problem of Physical Efficiency in the Shipyards, by L. Erskine, pp. 8 and 9.)

INDUSTRIAL CANTEENS SHOULD CONFORM WITH REQUIREMENTS OF THE FOOD ADMINISTRATION

Another important factor to be taken into account in all war-time planning of menus here in the United States is the necessity of conforming strictly with the requirements of the Food Administration. In this connection the following excerpts from a recent letter by Prof. C. F. Langworthy, Chief, Home Economics, States Relation Service, United States Department of Agriculture, merits careful attention, as the statement comes from one of the world's best authorities.

I recognize the importance of the lunch room and restaurant project for the shipyards doing the construction work for the Emergency Fleet Corporation. Not only is it desirable that good, wholesome, nutritious food prepared under proper sanitary and other conditions should be provided, but it is also important that the food, while acceptable, should correspond to the requirements of the Food Administration. In my opinion it is desirable that recipes and menus should be prepared by this office and the Food Administration co-operating with the Emergency Fleet Corporation.

MENUS

The following series of menus is from the mess hall of the Military School of Aeronautics at Cornell University, Ithaca, N. Y. It represents a well-balanced dietary extending over a period of two weeks, February 14 to and including February 27, 1918.

Week of February 14 to 20
BREAKFAST

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
Apple sauce. Corn meal. or fried Grapenuts Canned apples. Coffee, cocoa, or milk.	Canned pears. Rolled Oats or Puffed Wheat. Omelet. Coffee, cocoa, or milk.	Oranges. Hominy or Shredded Wheat. Sausage. Coffee, cocoa, or milk.	Rolled Oats or Post Toasties. Buckwheat cakes. Coffee, cocoa, or milk.	Apple sauce. Hominy or Puffed Rice. Creamed dried beef. Coffee, cocoa, or milk.	Oranges. Rolled Wheat or corn flakes. Fried mush. Coffee, cocoa, or milk.	Figs. Corn meal or grape- nuts. Scrambled eggs. Coffee, cocoa, or milk.
LUNCH ¹						
Ham and cheese soufflé. Baked potatoes. Fruit salad. Tea or milk.	Cream asparagus soup. Salmon loaf. French fried potatoes. Dill pickles. Apple tapioca. Tea or milk.	Vegetable soup. Corned beef and cab- bage. Boiled potatoes in jackets. Jam. Rice pudding. Tea or milk.	Consommé. Browned steak. Baked potatoes. Carrots and peas. Ice cream. Coffee or milk.	Cream of rice soup. Italian macaroni with meat. French fried potatoes. Apple butter. Cottage pudding. Chocolate sauce. Tea or milk.	Hamburg steak, horse- radish sauce. Fried potatoes. Chocolate blanc mange. Tea or milk.	Vegetable soup. Lima beans. Escalloped tomatoes. Pickles. Apple brown Betty. Tea or milk.
DINNER ²						
Clear tomato soup. Chicken pie. Boiled potatoes. Buttered peas. Chocolate cake, choco- late icing. Coffee or milk.	Vermicelli soup. Roast beef. Fried fish, Tartare sauce. Parsley, potatoes. Buttered beets. Ice cream. Coffee or milk.	Split pea soup. Roast lamb. Browned potatoes. Spinach. Apricot tapioca.	Welsh rarebit with to- matos on toast. Escalloped potatoes. Strawberry jam. White cherries. Ginger cookies. Milk or tea.	Vegetable soup. Roast beef. Mashed potatoes. Buttered turnips. Ice cream. Coffee or milk.	Split pea soup. Pot roast. Boiled potatoes. Hot slaw. Suet pudding. Coffee or milk.	Rice soup. Roast lamb, mint sauce. Browned potatoes. Creamed peas. Ice-cream. Coffee or milk.

¹ Dinner on Sunday.

² Supper on Sunday.

Week of February 21 to 27

BREAKFAST

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
Bananas. Rolled Oats or Puffed Wheat. French toast. Coffee, cocoa, or milk.	Apricots. Honey or Shredded Wheat. Codfish. Coffee, cocoa, or milk.	Raw apples. Rolled Oats or Toasties. Sausage. Coffee, cocoa, or milk.	Grapefruit. Hominy or Puffed Rice. Pancakes. Coffee, cocoa, or milk.	Apricots. Rolled wheat or corn flakes. Liver and bacon. Coffee, cocoa, or milk.	Oranges. Corn meal or Grape-nuts. French toast. Coffee, cocoa, or milk.	Prunes. Rolled Oats or Puffed wheat. Fried mush. Coffee, cocoa, or milk.

LUNCH ¹

Cream celery soup. Meat pie. French fried potatoes. Apple sauce. Cookies. Tea or milk.	Macaroni and cheese. Baked potatoes. Dill pickles. Gingerbread and whipped cream. Tea or milk.	Salmon croquettes. Creamed potatoes. Pickles. Apricot taploca. Tea or milk.	Consommé. Stewed chicken. Escalloped corn. Boiled potatoes with cream sauce. Ice cream. Coffee or milk.	Cream tomato soup. Frankfurters and sauerkraut. Boiled potatoes. Mustard. Fruit salad. Tea or milk.	Cheese pudding or cold meat. Baked potatoes. Cabbage salad. Canned pears. Tea or milk.	Soup. Hot roast beef sandwiches. Rice and cheese. Apple sauce. Fried cakes. Tea or milk.
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DINNER ²

Vermicelli soup. Baked ham. Succotash. Mashed potatoes. Peach shortcake. Coffee or milk.	Barley soup. Roast beef or fish. Boiled potatoes. Buttered carrots. Ice cream. Coffee or milk.	Vegetable soup. Broiled steak. Baked potatoes. Creamed string beans. Rice pudding. Coffee or milk.	Welsh rarebit. Escalloped potatoes. Apple butter. Chocolate cake and white icing. Tea or milk.	Chicken soup. Pot roast. Browned potatoes. Creamed cabbage. Ice cream. Coffee or milk.	Vermicelli soup. Baked ham, horse-radish sauce. Browned potatoes. Escalloped tomatoes. Cherry taploca. Coffee or milk.	Rice soup. Hamburg steak. Escalloped potatoes. Creamed string beans. Ice cream. Coffee or milk.
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¹ Dinner on Sunday.² Supper on Sunday.

The following menu and list of things served on Monday, March 18, 1918, at the extensive plant of the Submarine Boat Corporation, Newark, N. J., indicate that the dishes offered there "are designed to supply the men with the kind of food they want and food with the proper calorific values which men doing heavy manual labor require":

	Cents		Cents
Pea soup.....	10	Apples.....	5
Roast corned beef, apple sauce.....	30	Ham or cheese sandwiches (each).....	5
Corned beef and cabbage.....	25	Sardine sandwiches (each).....	10
Pie.....	5	Coffee.....	5
Cake.....	5	Milk.....	5

SAMPLE OF THINGS SERVED¹

	Cents per portion		Cents per portion
Soups.....	10	Beef à la mode.....	25
Clam chowder.....	15	Fried sausage with potatoes.....	25
Fish cakes, tomato sauce.....	20	Roast loin of pork, apple sauce.....	30
Boiled codfish, potatoes.....	25	Lamb stew (soup bowls).....	25
Baked bluefish.....	25	Beef stew (soup bowls).....	25
Fried smelts, Tartar sauce.....	25	Chicken potpie.....	35
Boiled beef with vegetables.....	25	Baked pork and beans.....	20
Pot roast, spaghetti and potatoes.....	25		

¹ Bread and rolls served with each portion.

The following sample menus are from mess hall No. 2, Hog Island, Philadelphia, where combination meals are served at 30 cents each:

JANUARY 14, 1918

Breakfast.	Dinner.	Supper.
Oatmeal. Liver or sausage. Fried potatoes. Bread and butter. Coffee.	Pea soup. Roast beef. Steamed potatoes. Beans. Bread and butter. Coffee.	Frankfurters. Sauerkraut. Steamed potatoes. Bread and butter. Coffee. Bread pudding.

JANUARY 20, 1918

Oatmeal. Ham. Scrambled eggs. Fried potatoes. Bread and butter. Coffee.	Vegetable soup. Beef stew. Boiled potatoes. String beans. Cottage pudding. Bread and butter. Coffee.	Pot roast. Steamed potatoes. Bread and butter. Hominy. Apple sauce. Tea.

The following menu was offered at the Westinghouse Lamp Works' cafeteria, Watessing, N. J., March 8, 1918. This plant supplies lunches to from 500 to 800 employees, but at a loss of about \$100 per week at the prices indicated.

	Cents		Cents
Clam chowder.....	5	Baked apple.....	5
Creamed fish on toast.....	10	Sauerkraut or spaghetti.....	5
Hard boiled eggs and potato salad.....	10	Mashed turnips.....	5
Hot frankfurters, mashed potatoes and brown gravy.....	10	Tapioca pudding.....	5
Hot beef sandwich.....	10	Ice cream or cake.....	5
Ham or cheese sandwich.....	4	Choice of pie.....	5
Head lettuce and mayonnaise.....	5	Tea, coffee or milk.....	5

The following menu was offered at the Hyatt Roller Bearing Co.'s cafeteria, Harrison, N. J., Thursday, March 7, 1918:

	Cents		Cents
Vegetable soup.....	5	Corned beef hash.....	2
Pork and beans.....	10	Boiled ham and potato salad.....	20
Frankfurters and baked beans.....	15	Rice pudding.....	5
Beefsteak pie.....	20	Stewed prunes.....	5
Creamed turnips.....	5	Coffee.....	5
Vegetable dinner.....	20	Cocoa.....	5
Waldorf salad.....	5		

Here is a typical menu of a regular noon-day meal served for 25 cents at one of the several cafeteria restaurants of the American Sheet and Tin Plate Co., Pittsburgh, Pa.:

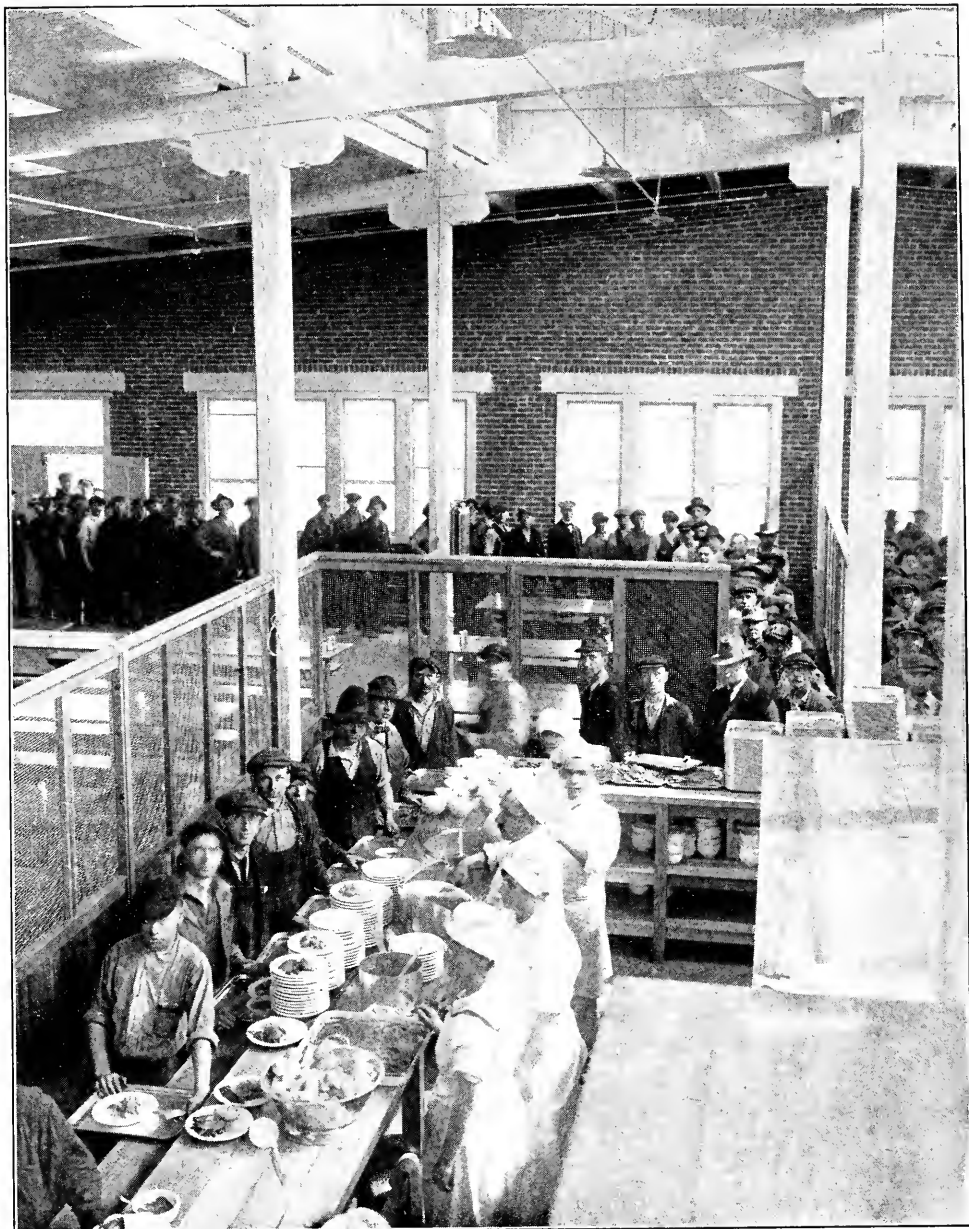
Baked white fish or roast beef.
Browned potatoes.
Stewed tomatoes.
Bread and butter.
Pudding or stewed fruit.
Coffee.

The following menus represent four widely separated days at the cafeteria of the Bureau of Engraving and Printing, Washington, D. C. These menus include the prices charged and, therefore, possess an added interest, as they indicate quite clearly the recent rapid upward trend of food costs. These menus include the combination dinner which was furnished at 15 cents in 1916 and up to October, 1917, when the price was advanced to 20 cents. The present (November, 1918) price is 25 cents.

Some 8,000 meals, or portions of meals, per day are now dispensed at the Bureau of Engraving and Printing. The fact that both men and women are served in large numbers makes it possible and, as experience has demonstrated, desirable to offer a somewhat extensive choice of sandwiches, pastry, and fruits in addition to the combination dinner. The combination dinner seems to be most successful when it is not the only choice.

The employees of the Bureau of Engraving and Printing have a co-operative organization and the cafeteria is managed and conducted, without profit, by the employees. The equipment and space is furnished by the Bureau. That the plan is successful is evident from the fact that about 70 per cent of the employees take advantage of the facilities offered.

The menus from this excellent cafeteria indicate the variety in the combination dinners from day to day and the popularity that certain individual dishes, such as baked beans, mashed potatoes with gravy, and cold slaw, have attained. Demand governs supply where the cafeteria is managed by those who patronize it.



INTERIOR VIEW, CAFETERIA OF THE NEW YORK SHIPBUILDING COMPANY,
CAMDEN, N. J., SEPTEMBER, 1918

FRIDAY, FEBRUARY 1, 1916

Dinner, 15 cents.

Sausage cake; boiled hominy; mashed potatoes; bread and butter; coffee.

SOUP

Beef à l'Anglaise, 5 cents.

ENTREES.

Brunswick stew, 5 cents. Baked beans, 10 cents. Liver, fried with onions, 10 cents. Spaghetti
Italienne, 5 cents.

SALADS.

Combination, 5 cents. Potato, 5 cents. Stuffed olives, 5 cents.

SANDWICHES.

Chili cheese on rye bread, 5 cents. Minced ham, 5 cents. Club sandwich, 5 cents. Swiss cheese
on rye bread, 5 cents. Ham, 5 cents.

PASTRY AND FRUITS.

Pie made on the premises: Green apple, 5 cents. Pumpkin, 5 cents. Peach, 5 cents. Mince, 5
cents. Custard, 5 cents.

Stewed prunes, 5 cents. Sliced oranges, 5 cents. Assorted fruits, 5 cents. Tapioca pudding, 5 cents.

ICE CREAM.

Five flavors, 5 cents per order.

MONDAY, DECEMBER 10, 1917

*Dinner, 20 cents.*Boiled ham and cabbage or macaroni. Boiled potatoes. Three slices bread or two pieces corn bread.
One pat butter. Coffee, tea, milk, or cocoa.

No bread or butter with the following:

Brunswick stew, 10 cents. Liver with onions, 10 cents. Baked beans, 10 cents. Baked beans (small)
5 cents. Mashed potatoes and gravy, 10 cents. Cold slaw, 5 cents. Beef salad, 5 cents. Bean
soup, 5 cents.

Four slices bread and one pat butter, 5 cents.

Swiss cheese on rye bread, 5 cents. Ham, 5 cents. Stewed prunes, 5 cents. Bread pudding, vanilla
sauce, 5 cents. Pie made on premises: Green apple, peach, mince, pineapple, 5 cents.Tea, 5 cents. Coffee, 5 cents. Milk (mug), 5 cents. Milk (bottle), 7 cents. Coca-Cola, 5 cents.
Ginger ale, 5 cents. Sarsaparilla, 5 cents. Cocoa, 5 cents.

Ice cream, four flavors, per order, 5 cents.

WHEATLESS DAY—MONDAY, MARCH 25, 1918

*Dinner, 20 cents.*Corned beef and cabbage. Mashed potatoes. Three slices bread or two pieces corn bread. One
pat butter. Coffee, tea, milk, or cocoa.

No bread or butter with the following:

Goulash, 10 cents. Baked beans, 10 cents. Baked beans (small), 5 cents. Beef hash with peppers,
10 cents. Mashed potatoes and gravy, 10 cents. Cold slaw, 5 cents. Beet salad, 5 cents.
Bean soup, 5 cents.

Four slices bread and one pat butter, 5 cents.

FRIDAY, APRIL 5, 1918

Dinner, 20 cents.

Roast veal or shad, stewed corn or macaroni. Mashed potatoes. Three slices bread or two pieces corn bread. One pat butter. Coffee, tea, milk, or cocoa.

No bread or butter with the following:

Kidney stew, 10 cents. Fish roe, scrambled eggs, 10 cents. Baked beans, 10 cents. Baked beans (small), 5 cents. Salmon salad, 10 cents. Mashed potatoes and gravy, 10 cents. Cold slaw, 5 cents. String bean salad, 5 cents. Clam chowder, 5 cents.

Four slices bread and one pat butter, 5 cents.

It would be difficult to close this section on menus with a more apt quotation than the following, which sums the matter up admirably:

The necessary dietary for a worker, broadly speaking, is a dietary containing a sufficient proportion and quantity of nutritive material, suitably mixed, which is easily digestible, appetizing, and obtainable at a reasonable cost. (Health of Munition Workers' Committee, Report on Industrial Canteens, p. 4. London, 1915.)

ADMINISTRATION AND MANAGEMENT

CAFETERIA VS. OTHER PLANS

In the great majority of cases the cafeteria or self-service plan of feeding large numbers of men seems to be most satisfactory. It is quickest and cheapest, two powerful arguments in its favor.

The cafeteria method of serving seems to be especially desirable where large numbers must be taken care of in a short space of time, as the two, four, or six way cafeterias permit very rapid service. One company states that 1,500 people are served by this method in nine minutes and another that 1,300 are served in six minutes. ("Lunch Rooms for Employees," by Anice L. Whitney, Monthly Review of the U. S. Bureau of Labor Statistics, December, 1917, pp. 207-208.)

Our lunch room is conducted on the cafeteria plan. A careful study of this question was made and it was found that this plan could be best adapted to operation with the minimum amount of help; offer the quickest service; and at the same time give the largest choice of menus. We have a capacity of 132 and counts recently taken indicate that approximately 60 per cent of our working force patronize the restaurant. The busiest time is during the hours of 11 and 12.30 and the average attendance between these hours is from 400 to 500, and approximately 2,000 men patronize the restaurant every 24 hours; so that now our men walk, in an orderly fashion, into a building where they get a good, substantial meal properly balanced and at reasonable rates, instead of rushing for poor lunches and worse drinks, as was the case a few years ago. (Extract from Illinois Steel Co.'s letter of Apr. 2, 1918.)

MANAGEMENT

As with the shipyard itself, the success of the restaurant facilities will depend very largely upon the manager or person directly responsible for the buying, preparing, and dispensing of the food, the maintenance of adequate service, the setting up and maintaining of a high standard of cleanliness, sanitation, and hygiene and general attractiveness of the whole layout.

Management is of three main types,¹ a manager employed by and directly responsible to the shipbuilding or other company, an outsider contracting with the company to manage the restaurant, and management by or under the control of the workmen themselves. The first plan has most to commend it, assuming

¹The success of an industrial canteen depends in considerable degree upon its management. Speaking generally, three methods, which are not mutually exclusive, are available. The employer may manage, the workers may appoint a management committee, or the entire direction may be contracted out to a professional or voluntary caterer. In not a few of the most successful canteens joint control is exercised by employer and men (an elected shop committee with a chairman representing the management) who may or may not contract out the catering. The method of control is materially affected by the proprietorship. (Health of Munition Workers' Committee Report on Industrial Canteens, p. 6. London, 1915.)

that a thoroughly competent and experienced person is intrusted with this most important function.

In one of the large shipyards a man with 25 years of varied experience has been appointed to take charge of the extensive kitchen, cafeterias, and mess halls. This company believes that "the results obtained have confirmed the wisdom of not putting the commissary on a contract basis, as it was believed that the best results for the employees could be obtained by operating on a non-commercial basis with a man of experience in charge."

As a general rule, the contracting-out plan is unsatisfactory. The company must, in any event, supervise and control such matters as prices, cleanliness, quality of food, etc., if the restaurant facilities are to be popular and of the greatest benefit both to employees and employer.¹

There is almost always grave danger of profiteering at the expense of the workmen and indirectly at the expense of the employer also when restaurant privileges are farmed out. There probably are a few exceptions to this rule, but experience here and abroad indicates that the company should almost invariably itself appoint and directly control the restaurant manager if the best results are to be obtained, at the lowest cost to the men. In any arrangement whereby the manager gets a definite percentage of profit over and above all expenses, a temptation is offered to an unscrupulous manager to increase rather than decrease the outlays for food, service, etc.

THE NUMBER OF EMPLOYEES OR STAFF NECESSARY FOR AN INDUSTRIAL CAFETERIA

The number of employees necessary for the preparation and dispensing of food in an industrial canteen, cafeteria plan, should not much exceed 30 for every 1,000 persons served at one sitting. The proportion will, of course, vary with the size of the cafeteria, proportionately more employees being necessary in the smaller canteens. If special waiter service is desirable or necessary for a considerable force of administration and clerical employees, superintendents, foremen, etc., then the canteen staff will require to be correspondingly enlarged. In most cases the cafeteria or self-service plan should be adaptable to practically all the employees of the plant. A separate serving counter and dining room for the officials and clerical staff in the larger plants may prove of advantage. An extra charge should be made for meals where the method of service is more expensive, even though the food served is exactly the same in quantity and quality as that supplied to the men in the main dining rooms and mess halls.

The following quotation from a British source will serve as a guide, as it is in general conformity with the experience of some of the most successful public and industrial cafeterias in this country:

STAFF OF CANTEEN

As will be understood, it is not always the quantity of staff that matters, but the quality.

The following are the number of staff generally required for—

A. A canteen seating 100: One cook. Three assistants, servers, etc. One cashier and ticket seller. One storekeeper.	B. A canteen seating 500: One head cook. One under cook. Ten assistants, servers, etc. Two cashiers and ticket sellers. One storekeeper.	C. A canteen seating 1,000: One head cook. Two under cooks. Twenty assistants, servers, etc. Four cashiers and ticket sellers. One storekeeper. One assistant storekeeper.
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¹ The majority of the industrial and company lunch rooms, canteens, and restaurants in operation in the United States are managed directly by the companies. In several cases, however, the management is intrusted to an outsider, but even in such cases the companies usually supply space, light, heat, and equipment and retain supervision of the quality of the food offered and limit the prices charged. (See "Lunch Rooms for Employees," by Anice L. Whitney, U. S. Bureau of Labor Statistics, December, 1917, p. 209.)

If an equally large number of persons have to be served at night, practically the same staff is required, but it is possible to reduce the night staff by arranging for day cooks, etc., to prepare certain articles, etc., in advance for the night.

In addition to above staff, there should be a manager or manageress for the day and night. (Feeding the Munition Worker, p. 18. London, 1916.)

The next quotation is from an experience somewhat different from that recommended in this pamphlet, as it is not strictly on the cafeteria plan.

The number of attendants necessary to serve an average of 4,100 people daily is reported by one firm. This company has four restaurants—a cafeteria, a dining-room, a lunch counter, and a grill room. The cooking for the four restaurants is done in one kitchen and the same quality of food is served in all. Employees are free to patronize any of them, although the cafeteria is the one generally preferred. Besides the manager, his assistant, and the chef, there are 13 full-time kitchen and dining room workers and about 70 others who work during the luncheon period only. Twenty of these are porters in the plant who clear away the used dishes.

It is the practice of a number of companies which have cafeterias to have the employees carry their used dishes to a shelf or window which they pass on the way out. In this way the amount of help needed is lessened without imposing unduly upon each individual.

(Lunch Rooms for Employees, by Anice L. Whitney, Monthly Review, U. S. Bureau of Labor Statistics, December, 1917, pp. 211-212.)

It is well always to keep in mind that an abundance of labor-saving devices, the self-service plan, and a carefully worked-out scheme by which the men can come to the counters in shifts, all tend to reduce the number of cafeteria employees necessary for quick and efficient service. It is hardly necessary to add that the overhead costs can be kept at a minimum only by rigid adherence to these same methods.

This matter of service is so important that the following quotation is presented in the hope that the suggestions contained therein may prove useful:

SERVICE

The best system is that by which the workers wait upon themselves, obtaining meals at the service counter and carrying them to the tables. This is undoubtedly the most economical and, where proper arrangements for speedy service are in force, the most satisfactory.

It is essential to remember that the workers demand a quick service, and the efficiency or otherwise of the canteen depends upon the success with which this demand is met.

Preparations for the "rush" of customers should be made in good time.

A sufficient number of portions should be cut off and stored in the hot closets, which are most conveniently placed beneath the service counter.

The dishes obtainable at each hatch or section of the counter should be indicated by notice boards, and a special assistant, preferably the same person each day, should be assigned to each hatch or section.

The entire staff of the canteen should assist to cope with the pressure of work at mealtimes, and all other less pressing work should be deferred until later. The manager or manageress should take no part in the actual service, but should supervise the work vigilantly with a view to its speedy and efficient performance.

Special arrangements are necessary for the feeding of men and women of different sections on different hours and on night shifts, if business is to be carried on properly and continuously. (Feeding the Munition Worker, pp. 17 and 18. London, 1916.)

Opposite page 50 is shown an interior view of the New York Shipbuilding Company's cafeteria, Camden, New Jersey. The photograph was taken before the equipment, steam tables, etc., were completely installed. The photograph, however, shows one of the four two-way units. On the day the picture was taken (September 26, 1918), notwithstanding the handicap of incomplete equipment, 533 men were served in this two-way unit in twenty minutes.

ORDER AND DISCIPLINE ESSENTIAL TO QUICK SERVICE

Given the necessary good construction arrangements, long counters, wide passageways, proper table and seat spacings, etc., the service will not be prompt and efficient unless order and discipline are observed. On this point the following statement by an experienced observer is à propos:

The self-service cafeteria lunch room is the only practical type for such plants as the shipyard, but it must be borne in mind that in the lunchroom, more than in any other part of the yard, order and discipline must be maintained if satisfactory conditions are to be obtained. (The Problem of Physical Efficiency in the Shipyards, by L. Erskine, p. 9.)

UNDESIRABILITY OF SERVING LUNCHESES IN WORKROOMS

It is generally conceded to be desirable for employees to eat their lunches or meals outside of or away from their workroom. Aside from the obvious fact that many workrooms are unsanitary as lunch places, because of dusts, gases, or other poisonous materials, it is important that the workers leave their work places long enough to eat their lunch in a fresher, more attractive environment. This also in many cases affords an opportunity for a thorough ventilation of the workshop or workroom.

For the relief of monotony, an important factor in connection with industrial canteens, a change of surroundings during the meal and a short walk before partaking of it are desirable. On this account, and also on account of the importance of ventilating the workshop so that the air may be fresh when the workers return, the custom of eating meals within the workshop should be discontinued, and all food should be taken in a canteen, restaurant, in the open air, or at least away from the ordinary place of work. (A second Appendix to Memorandum No. 3 (Industrial Canteens), Health of Munition Workers' Committee. By Leonard E. Hill, M. B., F. R. S., a member of the committee, p. 5. London, 1916.)

Most of the industrial codes require a pause of from 45 to 60 minutes during noon hour, but no provision is made for a place within the factory where the employees may eat their midday lunch. The consequence of this omission in the factory laws is that workers eat their lunch at the machine tables, very often with soiled hands, and often soil the material with which they work, leaving crumbs and parts of vegetables, fruit, and other organic matter around tables, chairs, and work places, where there is much dust or where poisonous materials are being worked with. The eating of lunch within the shop is injurious to health and may cause disease. Some industrial codes insist upon separate lunch rooms in certain dangerous trades. (The Modern Factory, by George M. Price, M. D., p. 281.)

Even when the food itself is nourishing and readily digestible it happens, too frequently, that it has to be eaten under conditions which militate against its real value. A meal hastily swallowed with one eye on the clock in the brief interval between long journeys to and from the works can not be satisfactory any more than a meal taken amid dirt and dust in the close atmosphere of a workshop which has been occupied for some hours by a body of toiling men and women, or in an overcrowded coffee shop permeated with the odors of cooking. (Feeding the Munition Worker, p. 4. London, 1916.)

Students of the effects of industrial fatigue have laid stress upon the dangers of long working hours without proper intervals for rest and food. The recommendation of the English health of munition workers' committee is emphatically in favor not only of an hour for the main meal period, but also of short breaks of 10 or 15 minutes during long spells of work. Even on eight-hour shifts the minimum allowance for mealtime should in their opinion be half an hour. (Munition Workers, Hewes & Walter, p. 42.)

IMPORTANCE OF ATTRACTIVE DINING AND MESS ROOMS

The success or failure of cafeterias or other plans of feeding arrangements is dependent upon several factors, and not the least of these is the general attractiveness or otherwise of the dining and mess halls. Good light and ventilation, cleanliness, and neat appearance of furniture and other equipment will go far toward making the lunch facilities popular.

Whatever system of management is adopted, it should be the aim to make the canteen as attractive as possible to the workers, to make them feel that it is their canteen (not a charitable institution), a place where they can expect a good meal at a reasonable price under good conditions, and where they can leave the atmosphere of the works behind them. Irritating rules and regulations should be reduced to a minimum, and the workers' legitimate wants studied as far as possible. (Feeding the Munition Worker, p. 17. London, 1916.)

In a large cordage mill in central New York, I found the restaurant or lunch room located in a corner of a semi-dark basement. The firm complained that the lunch room was not appreciated and not used by their employees, and were rather indignant at my remark that I did not blame the workers for refusing to use such a lunch room. (The Modern Factory, by George M. Price, M. D., p. 281.)

COST OF FOOD

As already shown in several of the menus presented quite substantial, varied, and nutritious meals can be served on the cafeteria plan for from 20 to 35 cents.

The prices generally charged for a table d'hôte meal for factory workers vary from 15 to 25 cents, in the majority of cases the charge being 20 cents. In a few cases office workers pay slightly more. The à la carte prices vary, of course, greatly. The usual prices of bread and butter are from 2 to 5 cents; sandwiches, soups, and vegetables, 3 to 5 cents; meats, 8 to 15 cents; fruits and deserts, 2 to 5 cents; tea, coffee, and milk, 2 to 5 cents; the usual price of a cup of coffee being 3 cents. It is possible, in most of the cafeterias, to get a good lunch for from 15 to 20 cents, and in some of them for even less. It must be borne in mind, however, that the prices charged for food as quoted in this article do not cover the general rise in foodstuffs in the last few months. They only serve to show that the average cost of a sufficiently satisfactory meal was much below that of the average outside restaurant, and that it is probable, therefore, that whatever increase the employers may be obliged to make because of the present high prices of fuel and foodstuffs will be in the same proportion. ("Lunch Rooms for Employees," by Anice L. Whitney, Monthly Review, U. S. Bureau of Labor Statistics, December, 1917, p. 214.)

FOOD COST LARGELY DEPENDENT UPON CAREFUL, SKILFUL MANAGEMENT

The tariff can be kept low only by careful management. The food materials can be made to pay, but the incidental expenditure is relatively heavy. Workers are not accustomed to paying for food in canteens, and will not always purchase the most nutritious food. Tact, discretion, and an appropriate menu of proper dishes are necessary. Constant supervision and the careful adaptations of means to ends are needed to prevent loss if good food is to be sold quickly at the low price the worker can afford to pay. (Health of Munition Workers' Committee—Report on Industrial Canteens, p. 6. London, 1915.)

It will be found that by skilled cafeteria catering which is pleasing the eye and tempting the appetite with low cost, dainty dishes, the general cost of feeding the staff can be reduced, and at the same time the general satisfaction of the staff with the catering will be greater because each one has chosen what he wants as far as the selection will permit. (The Modern Hospital, Vol. III, p. 404, 1914.)

METHODS OF PAYMENT FOR MEALS

The most up-to-date method of payment for food, cafeteria service, is for the diner to be given a check, indicating the value of the food on his filled tray, as he leaves the food counter and enters the dining room. On his exit from the dining room the patron must pass a cashier, to whom payment is made of the amount punched or printed on the check.

There are different methods of payment in use by the various companies. One company, whose charges are based on the amount of wages, uses tickets of three colors to indicate the three rates which are charged. In some cases metal checks are used, while in others books of tickets are sold either by the cashier or by foremen in the shops. In the majority of cases, however, the employees pay cash. ("Lunch Rooms for Employees," by Anice L. Whitney, Monthly Review, U. S. Bureau of Labor Statistics, December, 1917, p. 211.)

The following quotation from the British report on industrial canteens may prove helpful:

SYSTEM OF TAKING CASH

It will be clear that the taking of cash at the counter, the giving of change, etc., is altogether incompatible with speedy service. It is essential that the system of taking cash should be so far as practicable proof against carelessness or fraud on the part of the canteen customers or servants, and should interfere as little as possible with the service.

The responsibility for taking cash should always be definitely allocated, no one except the authorized person, or persons, being allowed to take cash.

The best system is the "Ticket System." Under this system tickets of various values adapted to the trade are bought at the canteen or at a special office, and are then tendered at the serving counters for meals or for light refreshments to the value stated on the tickets.

Too great stress cannot be laid on the principle that in no case should meals be handed over the serving counters without a ticket being taken first. This should be made very clear to all canteen assistants, and it should be impressed upon them that they must only give food to the actual value of the ticket.

It may be advisable in large canteens to employ an attendant whose sole duty at meal times is to see that no meals are served unless a ticket is given up.

A point that must be insisted on is, that as soon as the tickets have been checked with the cash taken, they are immediately destroyed or defaced.

If the number of meals to be served can be approximately gauged, it is a good plan to have the tickets dated for the day of issue.

(Feeding the Munition Worker, p. 19. London, 1916.)

SUMMARY OF THE ESSENTIAL FACTORS IN A SUCCESSFUL CAFETERIA

The success of the works restaurant depends upon whether or not certain essential requirements are met.

The may be briefly summed up as follows:

Convenient location.—The restaurant must be convenient to the workmen.

Attractiveness.—It must be attractive, light, airy, well-spaced, and with plain but neat, clean, and attractive equipment.

Prompt service.—Service must be prompt. Slow service is certain to make the works restaurant a failure.

Hours.—The restaurant should be open at all hours when there are night shifts. Coffee, tea, cocoa and milk should be obtainable at any time.

Food.—The food served should be of first-class quality: Fresh, properly prepared and cooked, appetizing, and of good variety.

Prices.—The price of the food to the workmen should be so low as merely to cover cost, or at most to provide only a small margin above cost. The price of any given meal or articles of food should be prominently displayed. This is essential for prompt and satisfactory service.

Payment for food.—The method of payment for meals should be simple, preferably by ticket or check with the meal and payment of cash to cashier on exit. Tickets purchased in advance save the workmen from carrying much change in work clothes.

Management.—First and last the success or failure of the works restaurant is dependent upon the manager.

LUNCH-ROOM ACCOUNTING¹

The purpose of any system of accounts is to give the management of the business such information regarding the results of past operations as will help them to handle the business to the best possible advantage in the future. Different people have different ways of looking at the same proposition, so it is the purpose of this section to show how a system of accounts may be worked out, rather than to lay down a hard and fast set of rules to be followed regardless of conditions that may prevail in special cases.

We will assume, to begin with, that facilities are already available for handling the pay rolls and for auditing and paying the bills. It will also be assumed that the accounts will be handled through agencies already established, so that our only concern will be to outline that section of the accounts which has to do with the investment in lunch-room equipment and with the results of lunch-room operation. We are going to try to tell the management what they want to know, so for the moment we will put ourselves in their place and imagine what questions they are likely to ask. Then we can set up accounts which will give the answers to the questions. We will also number the accounts for ease in handling and reference.

¹This section has been prepared by Mr. Gordon Wilson, General Auditor, Emergency Fleet Corporation.

First of all, the management will want to know how much money they have invested in the business and the form in which this investment stands. We can analyze this investment and will probably find that it consists of:

1. Lunch-room building.
2. Furniture and fixtures.
3. Mechanical equipment, such as dishwashers, potato peelers, etc.
4. Kitchen utensils.
5. Dishes and glassware.
6. Cutlery and silverware.
7. Linen.
8. Lunch-room supplies (foodstuffs and other operating supplies).
9. Lunch-room merchandise (materials carried in stock for sale, such as cigars and tobacco, candy, chewing gum, etc.).
10. Cash.

Some managers may want more details than we have provided here and some may be content with less. Some may be willing to lump the mechanical equipment with the furniture and fixtures, while others may want refrigerators segregated and carried in a separate account. The lunch-room supplies account may be split into several accounts to very good advantage. Instead of one account for lunch-room supplies there may be separate accounts for meats, vegetables, canned goods, operating supplies (soap, scouring compounds, etc.), etc. The information afforded by these additional accounts would all be interesting; and, in the case of a large and properly run restaurant or system of restaurants it would be necessary; but when the lunch room is to be run as a side line, so to speak, too much detail should be avoided. We will proceed on the theory that the management is satisfied with the information afforded by the accounts that we have outlined and with the assurance that the methods of handling outlined hereafter will apply in the case of few accounts or many.

It will not be sufficient to go to the management and tell them that during a certain month the lunch room showed a profit or a loss of a certain sum. They will want to know why it lost money, or they will want to be told enough about it to assure themselves that it made as large a return as it could. Therefore, we will want to be prepared to give them some detailed information along the lines set forth in the following operation accounts:

11. Sales of meals.
12. Miscellaneous sales (grease and other kitchen by-products, refunds on bottles, bags, other containers, etc.).
13. Merchandise sales.
14. Cost of supplies used in preparing meals.
15. Cost of merchandise sold.
16. Supervising labor (salaries or other compensation, including contract payments, of managers and assistants, clerks and cashiers).
17. Labor (cooks, waiters, dishwashers, janitors, etc.).
18. Fuel.
19. Ice.
20. Miscellaneous operating expenses (telephone, stationery, laundry, etc., and other miscellaneous operating expenses).
21. Equipment renewals (payments for table linen, dishes, etc., bought to replace broken or worn-out equipment, also purchases of new items of equipment which cost so little, say, \$5 or less, that they are not worth charging to the property account).
22. Rent (if the lunch room should happen to be in a rented building).
23. Depreciation of buildings and equipment.
24. Profit and loss.

Now, we will assume that the lunch room has been running for a month. The payrolls, cash book, and voucher registers are closed and we have made the proper postings from them to the accounts that we have set up. Promptly on the close of business on the last day of the month we will take an inventory of the lunch-room supplies and the lunch-room merchandise that remain on hand.



CAFETERIA OR SELF-SERVICE COUNTER, MERCHANT SHIPBUILDING CORPORATION, HARRIMAN, P.A., JUNE, 1918

Having listed all the items comprised under each of these captions, and having determined the amount of each in stock, we price them at the latest price paid for each class of article and figure their value. In cases where the quantity of any article represents substantially more than the amount of the last purchase, and the price paid has fluctuated very widely, this price fluctuation should be recognized by pricing only the amount of the last purchase at the last purchase price, and the balance at the last previous purchase price. The totals of these values will give us the totals of our lunch-room supplies and lunch-room merchandise inventories as of that date. During the month we have charged our supplies and merchandise accounts with all purchases made, and the difference between the totals of these charges and the inventories remaining on hand must have been consumed or sold. Therefore, we calculate these differences and make a journal entry charging, for instance, cost of merchandise sold and crediting lunch-room merchandise. This transfers the cost of the merchandise that has been sold to the debit of an operating account and reduces the balance of the lunch-room merchandise inventory to the value of stock actually on hand. We will do the same thing with the lunch-room supplies, charging cost of supplies used in preparing meals, and we may handle our fuel in the same way, by opening an additional inventory account, if the fuel is bought in considerable amounts and the quantity on hand at the end of the month varies to any extent from time to time. The way in which the entries run in one of these inventory accounts is shown in figure 1.

FIGURE 1

1918.		LUNCHROOM MERCHANDISE ACCOUNT		Dr.	Cr.
May	1-31	Purchases		\$100.00	
	31	Cost of merchandise sold			\$40.00
	31	Balance as per inventory			60.00
				100.00	100.00
June	1	Balance forward		60.00	
	1-30	Purchases		50.00	
	30	Cost of merchandise sold			60.00
	30	Balance as per inventory			50.00
				110.00	110.00
July	1	Balance forward		50.00	

The purpose of the depreciation account is to charge up, as a part of the cost of doing business each month, a part of the shrinkage in the value of the property investment (accounts Nos. 1, 2, and 3) due to wear and tear through use. This property is bound to decrease in value as its age increases, even though it may be kept in first-rate working order through the medium of regular repairs (which we will charge to account No. 20). Finally, when it is absolutely worn out and worthless we do not want it to stand on our books at the figure which we paid for it when new. Therefore, we will make a journal entry each month, charging depreciation and crediting the building, furniture, and fixtures and mechanical-equipment accounts with a fair sum to represent the monthly proportion of their ultimate shrinkage in value. We will not take up

any depreciation on the kitchen utensils, dishes, and glassware, cutlery, and silverware, or linen, because these accounts represent classes of property which either wear out in a comparatively short time, or are likely to be broken or otherwise lost or destroyed before they can wear out. In their case, therefore, we will assume that the initial working equipment will be kept up to standard through regular purchases of new articles, made from time to time, as needed, and charged to equipment renewals.

FIGURE 2

LUNCHROOM INVESTMENT AS OF APRIL 30, 1918.

	Current month.	Last month.	Increase.	Decrease.
Building.....				
Furniture and fixtures.....				
Mechanical equipment.....				
Kitchen utensils.....				
Dishes and glassware.....				
Cutlery and silverware.....				
Linen.....				
Supplies.....				
Merchandise.....				
Cash.....				
Total.....				

ANALYSIS OF SUPPLIES AND MERCHANDISE ACCOUNTS.

	Supplies.	Merchandise.	
On hand, 1st of month.....			
Purchases during month.....			
Total to be accounted for.....			
Inventory, end of month.....			
Balance, used or sold.....			

At this stage we are prepared to take off a trial balance of our lunch-room accounts and see what they will tell us. First of all, we will take the balances of the investment accounts and use them as a basis for our monthly lunch-room investment statement, as outlined in figure 2. This statement is lined up in comparative form, so that the condition of affairs at the end of this month may be readily compared with the condition at the end of the previous month, with-

out the necessity of going back and referring to a previous statement. The figures in the columns headed "Increase" and "Decrease," may be given either in percentage or dollars, or, possibly, in both ways; the idea being to show the management in the most effective way just what changes have taken place in the property during the month.

The "Analysis of Supplies and Merchandise Accounts," shown in the statement, is added for good measure, because this analysis will answer the question as to whether or not too heavy inventories are being carried. In other words, if the management sees that the supplies inventory has increased \$1,000, or 2 per cent., or something like that, we want to be able to show them immediately, if we can, that the increase in inventory is made necessary by the much greater increase in amount of supplies used or sold during the month.

FIGURE 3

LUNCH ROOM OPERATING STATEMENT.

Month of _____, 19....

	Current month.			Last month.		
	Amount.	Per cent.	Per meal sold.	Amount.	Per cent.	Per meal sold.
Sales of meals.....		5				
Miscellaneous sales.....		95				
Total.....		100				
Less cost of supplies used.....		85				
Balance—Gross profit on meals.....		15				
Merchandise sales.....		100				
Less cost of merchandise sold.....		75				
Balance—Gross profit on merchandise.....		25				
Less supervising labor.....		12				
Labor.....		48				
Fuel.....		10				
Ice.....		5				
Miscellaneous operating expenses.....		5				
Equipment renewals.....		10				
Depreciation.....		10				
Total operating expense.....		100				
Balance—Net profit (or loss).....						

The trial balance of the operating accounts will be the basis for the lunch-room operating statement, illustrated in figure 3. Here it will be seen that we simply take off our trial balance for the current month, show the corresponding

figures for the previous month, and, with the addition of a few sub-totals and balances, make a complete analysis of the net profit or loss figure (shown at the foot of the statement). We show the gross profit on meals and the gross profit on merchandise, also the total operating expense necessary to obtain this gross profit and the balance left from the gross profit after the operating expenses have been paid. In addition to the actual figures, we show what each of these figures works out to per meal, on a basis of the number of meals sold. This is an important thing to watch and is helpful to the accountant in verifying the accuracy of his figures. For instance, if the lunch room is being run on a flat basis of 50 cents per meal, and the average receipts from sales of meals worked to 45 cents or to 55 cents, we would know at once that there was something wrong in the figures. The gross profits per meal served should be watched month by month, as, in fact, should all the other unit cost figures shown in this column. Arrangements should be made to draw them off in a columnar book, having a column for each month, so that they may be compared over longer periods than the two months the figures for which are shown on the regular statements. A constant study and comparison of these figures will do more to indicate extravagance or fraud than any other one thing that can be done in a short time. The percentage figures, for which columns are also provided, are also important. The most convenient thing to do would be to show all percentages as percentages of various subtotals, as indicated in the column for the current month. These are rough and ready percentages and will not give "percentages of profit," so-called, but they will enable one to keep an eye on the relationship of the various factors going to make up the profit and loss, and, if carefully and regularly compared in the same way as the unit figures per meal sold, will do much to indicate which are the strong points and which the weak ones in the lunch-room management. As a case in point, let us suppose that simultaneously with the employment of a new cook, the miscellaneous sales drop a couple per cent. below what they have been running, that will be a suggestion to look around and see whether the new cook is more economical than the old or whether he is failing to dispose of the kitchen refuse, etc., to the best advantage of the company.

FIGURE 4

BUSINESS HANDLED

	Current month.				Last month.			
	Total.	High.	Low.	Average.	Total.	High.	Low.	Average.
Breakfasts.....								
Lunches.....								
Suppers.....								
Night shifts.....								
Total meals sold.....								
Meals served to lunch-room help.....								
Total meals served.....								

As a supplement to this statement, we give a form for statistics (Fig. 4) relating to the volume of business handled and show, in addition to the total number of each meal handled, the highest number and the lowest number of meals served on any one day during the month and the daily average of the month. Such figures deserve study, because they are important factors affecting the profit and loss. High operating costs per meal may not be altogether the fault of the man who is running the lunch room, if conditions are such that he never knows how many people he will have to take care of. If he expects a thousand people for breakfast, he must have sufficient food and sufficient waiters, and other help, to take care of a thousand people. If only 500 show up, a large part of this preparation is wasted and the average cost per meal is bound to rise. The number of customers in excess of those expected is almost as bad, from a profit-and-loss point of view, because the hurry and confusion and general dissatisfaction resulting from the attempt to take care of more people than have been provided for will have almost as bad an effect on the operation of the lunch room as it will have in the efficiency of the industry which the lunch room serves.

There have been numerous cases where company lunch rooms have been changed from losing to profitable enterprises, and at the same time have given better service, by means of a little readjustment of the lunch hours in various departments, and the writer has one case in mind where lunch-room operations were made profitable, instead of unprofitable, by a slight lowering of the prices and increase in the quality of the food served, which resulted in giving the lunch room a large volume of regular business.

A lunch room is like a railroad, in that the average good citizen is not particularly ashamed to beat it if he can. Even if this were not the case, the fact still remains that every system of accounts must be laid out on the theory that somebody is going to be dishonest, if only to free people from temptation, who might otherwise be tempted to be dishonest. There are plenty of things around a lunch room that can be easily stolen and used, without very much chance of detection, for the immediate benefit of the thief; so we must watch those things and make it hard to steal them, so that nobody will be tempted to steal. We all know that in a machine shop, for instance, nobody will attempt to make away with a special cutting tool, which may have cost several hundred dollars, or a special fixture which may have cost a couple of thousand dollars; but the hand tools, micrometers and gauges and the small brass pieces and turnings, have to be watched, because they can be used or quickly turned into cash by the man who takes them away. Practically everything in a lunch room can be used by whoever can get away with it, and the order of their relative attractiveness, so to speak, depends practically on this point. We can classify them in the same way that we have classified our lunch-room investment accounts, as follows:

FIGURE 5

DAILY REPORT OF LUNCH-ROOM RECEIPTS

(Date) _____, 19....

Tours.	Checks issued.			Register readings.			Missing checks.
	Opening numbers.	Closing numbers.	Number issued.	Opening.	Closing.	Total sales.	
Breakfast.....							
Lunch.....							
Supper.....							
Night shift.....							
Total.....							
Merchandise.....							
Grand total.....							

.....
Cashier.

Cash.

Lunch-room merchandise.

Lunch-room supplies.

Linen, cutlery, silverware, dishes, glassware, utensils.

The essentials of the plan for protecting cash are, first, that no food or merchandise can be issued without a record being made of it; and, second, to make sure that this record gets into the accounts. The first of these requirements is served by any of the standard systems of meal tickets, coupons, and checks, provided the checks are so laid out that only one need be issued to each customer, even though he may add to his order several times during a single meal. None of these systems is better than the man who operates it, however; so our principal assurance that whatever system is adopted is being properly used must come from a constant and careful comparison of the analysis of the business, as outlined in figure 3, supplemented by frequent personal inspection by reliable people outside the lunch-room organization. The lunch-room organization itself should be so laid out that cashiers and food checkers, if there are any, shall report to some one other than the manager of the lunch room, and these people should be shifted around from time to time, or even assigned for a month or so to other duties, in order to break up any plans that may have been formed to beat the company. Whenever checks are used they should be numbered serially and a careful record kept of checks on hand, issued, and returned. In other words, each check must be accounted for from the time it is received from the printer until the time it is paid and canceled. A daily report, along the lines in figure 5, should be made to the bookkeeper and summarized by him. He should also verify the check numbers and the cash-register readings, and a thorough investigation should always be made of any missing checks.

Occasionally a customer will be able to get out of the lunch room with an unpaid check in his pocket, but each of these cases should be investigated right back to the waiter who issued the check, if only to convince the lunch-room staff that they are being watched closely and in detail. These reports should be summarized during the month, both as a basis for statistical figures regarding meals served and as a basis for an entry charging the cashier with the amount of cash reported under "Total Sales," which charge, in turn, will be offset by a credit to him for the cash that he turns in, leaving him charged with any cash that he may have retained for making change. He should be checked up frequently and at irregular intervals, to make sure that the cash on hand, in the cash drawer, is in agreement with the cash charged to him.

No lunch-room purchases should be paid for by the lunch-room cashier, where a lunch room is being run as an annex to an industrial plant. There is no necessity for doing it and the moral effect alone of paying creditors, whether large or small, by the company's check, is highly beneficial. If the lunch-room manager is authorized to make small purchases, he should be given a supply of special voucher forms or cash orders to be honored by the company's cashier. The advantage of this is that, if there should be any reason for suspecting the integrity of the people making these small purchases for the lunch room, a careful and immediate examination should be made to see if the merchandise called for by the orders or vouchers is on hand or can be accounted for. In the same way and for the same general reason, no miscellaneous sales should be collected by the lunch-room cashier. These should be regularly invoiced against the purchaser, on the company's forms, and collection made through the company's regular established collection agencies.

A sufficient number of cash registers should be a part of the equipment of every lunch room. The key of these registers should be kept by some competent person outside the lunch-room organization, so that no access may be had to the tapes or dials by any person who handles lunch-room cash.

The cigars, cigarettes, chewing gum and candy that are generally sold in connection with lunch-room operations, are frequently tempting objects to people who would not ordinarily think of stealing anything. All merchandise of this kind should, first of all, be inclosed in glass cases or behind screens, so that it can always be plainly visible, although it can only be reached by the man behind the counter. Since all this merchandise has a fixed selling value, a memorandum record should be kept, at selling values, of merchandise delivered for sale. In other words, the clerk should feel that he is charged, not with so many 5-cent cigars at 4½ cents, but with a certain number of 5-cent cigars at 5 cents each. This memorandum record should be credited with the sales, and when the monthly inventory is taken, it should be priced at selling values as well as at cost, and the total selling value of the inventory reconciled with the balance shown on the memorandum record.

The problem of keeping an accurate account of lunch-room supplies is perhaps the most complicated one, because here unreasonably large consumption may be due to waste and extravagance as well as to theft, and the waste may not always be controllable by the manager. For this reason the relationship between the sales of meals and cost of supplies used should be watched very carefully, as should also the cost per meal of supplies used. If these figures retain a proper relationship to each other, both currently and from month to month, and personal observation shows that there is no excessive waste, it may

be assumed that things are going as well as could be expected. Special supervision needs to be given to the prices for foodstuffs, in order to make sure that they do not contain any rebates or commissions, and all packages carried or sent out of the lunch room should be watched in order to be sure that things are not being carried away.

The linen and other equipment should be charged to some person who will be responsible for reporting all losses from wear, breakage, theft, or any other cause. These items should be correctly recorded. The accuracy of his reports should be tested by occasional physical inventories, which should correspond closely with the inventory account. Any radical discrepancies between the actual and book figures should be brought forcibly to the attention of the lunch-room staff, as they are indications that either the customers are getting away with the equipment or that the staff are not as careful as they should be.

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